505-41-33

EOSDIS Core System Project

Interface Control Document Between EOSDIS Core System (ECS) and Science Computing Facilities (SCF)

Revision A

September 1996

GODDARD SPACE FLIGHT CENTER
GREENBELT, MARYLAND

National Aeronautics and
Space Administration

Interface Control Document
between
EOSDIS Core System (ECS)
and
Science Computing Facilities (SCF)

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Preface

This document is a formal contract deliverable with an approval code 1. It requires Government review and approval prior to acceptance and use. This document is under ECS contractor configuration control. Once this document is approved, Contractor approved changes are handled in accordance with Class I and Class II change control requirements described in the EOS Configuration Management Plan, and changes to this document shall be made by document change notice (DCN) or by complete revision.

This ICD contains information pertaining to SCF interfaces in both Release A and Release B and updates the present baseline SCF ICD (reference document 505-41-40).

Any questions should be addressed to:

ESDIS Project Configuration Management Office
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Abstract

This Release A and Release B Interface Control Document (ICD) defines the functional and physical design of each SCF-unique interface between ECS and the SCFs, and includes the precise data contents and format for each interface. SCF-unique interfaces are those applicable to SCFs but not applicable to general users. All modes (options) of data exchange for each interface are described as well as the conditions required for each mode or option and the typical data rates. The sequence of exchanges are completely described. Communications protocols are detailed for each interface.

This ICD is derived from the ECS-SCF interface requirements, as described in the Earth Science Data and Information System (ESDIS) Project -- Level 2 Requirements, the Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Level 3 requirements, and the Interface Requirements Document Between EOSDIS Core System (ECS) and Science Computing Facilities.

This ICD contains information pertaining to both Release A and Release B. and is submitted to ESDIS as an update to the present ESDIS baseline ICD (reference document 505-41-40.

Keywords: SCF, ICD, LIS, CERES, Interface, Software, EOS, Science, Scientist, Computing MISR, MODIS, MOPITT, ASTER, SAGE III, ACRIM, SeaWinds, ALT RADAR

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Change Record Page

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Baseline	09/05/96	All	CCR 505-41-33-001
Revision A	09/25/96	All	CCR 505-41-33-003

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xii	Revision A	4-8	Revision A	5-20	Revision A	5-44	Revision A
xiii	Revision A	4-9	Revision A	5-21	Revision A	A-1	Revision A
xiv	Revision A	4-10	Revision A	5-22	Revision A	A-2	Revision A
xv	Revision A	4-11	Revision A	5-23	Revision A	A-3	Revision A
xvi	Revision A	4-12	Revision A	5-24	Revision A	A-4	Revision A
1-1	Revision A	5-1	Revision A	5-25	Revision A	A-5	Revision A
1-2	Revision A	5-2	Revision A	5-26	Revision A	A-6	Revision A
1-3	Revision A	5-3	Revision A	5-27	Revision A	AB-1	Revision A
1-4	Revision A	5-4	Revision A	5-28	Revision A	AB-2	Revision A
2-1	Revision A	5-5	Revision A	5-29	Revision A	AB-3	Revision A
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1. Introduction

1.1 Identification

This Interface Control Document (ICD), Contract Data Requirement List (CDRL) Item 029, whose requirements are specified in Data Item Description (DID) 209/SE1, is a required deliverable under the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

1.2 Scope

This ICD defines the detailed design of the external interfaces between ECS and the Science Computing Facilities (SCF) that are unique to ECS-SCF interaction. ECS-SCF interfaces satisfy the requirements specified in the Interface Requirements Document Between EOSDIS Core System (ECS) and Science Computing Facilities. The general user interfaces not covered herein support those capabilities that SCFs share with all other ECS users, such as the conduct of data searches. Interfaces are included herein if they are necessary for the SCF to carry out its role as software developer and provider and for quality assurance of the associated data products.

These SCF interfaces support science data production software development by the scientists at SCFs and support data processing and data reprocessing operations at the Distributed Active Archive Centers (DAACs) using SCF-developed science data production software. This ICD specifies “DAAC” for data flows between an SCF and DAAC operations staff and specifies “ECS” for all other data flows. The SCF interfaces include the transfer of science data production software for both standard and special products, coefficients and SCF-generated ancillary data, science data product quality assurance information, and information about science data processing and reprocessing. Other interfaces support remote integration and test of SCF-developed science data production software. The interfaces also support software maintenance changes.

The ECS-SCF IRD identifies all of the interfaces that are unique to the ECS-SCF interaction. Many of these flows are to be implemented between ECS software at the DAACs and ECS supplied software resident at the SCF. From a design perspective these interfaces are internal to ECS because they are between two ECS software items (e.g., client-server interaction where the client is provided by ECS). This ICD describes the details of those remaining external ECS-SCF interfaces that are between ECS or DAAC operations on one side and SCF staff or software that is provided by the SCF on the other side. Throughout this document the term “external interfaces” refers to these latter SCF interfaces.

The instrument planning, scheduling, commanding, and telemetry monitoring interfaces between ECS and the SCFs are not covered in this ICD. Concerning the Instrument Support Toolkit (IST), The IST Capabilities Document for the ECS Project explains the capabilities of the IST and defines the interface between the IST and the SCF workstation hosting the toolkit.

The definition of the interface between the IST and the EOSDIS Operations Center (EOC) are in ECS (FOS) internal requirements and design documents (because the EOC/IST interface is internal to FOS).

All SCF interfaces usually involve humans at the SCFs interacting with ECS. The SCFs can implement some interfaces by using ECS-provided software, can implement other interfaces by using public domain software, and can implement all remaining interfaces by using commercial off-the-shelf software rather than by coding new software to implement these interfaces. SCFs can optionally automate some interfaces by parsing notice email messages from ECS. Because these interfaces are intended to support interactions with humans, this ICD allows flexibility in the implementation of these interfaces.

The Earth Science Data and Information System (ESDIS) Project has responsibility for the approval and maintenance of this ICD. Any changes in the interface definition must be assessed at the ESDIS Project Level. This ICD is approved under the signature of the ESDIS Project Manager.

ECS Releases are keyed to mission support: Release Ir1 provides support to TRMM (Tropical Rainfall Measuring Mission) Early Interface Testing and Science Software Integration and Test. Release A provides support to TRMM Science Operations and TRMM Ground Systems Certification Testing. Release A also provides the functional capabilities needed to support early ESDIS Ground System Testing for the EOS AM-1 and Landsat 7 missions. Release B provides support to EOS AM-1 Mission Operations and Science Operations, provides support to ESDIS Ground System Certification Testing for the EOS AM-1 and Landsat 7 missions, and supports the SeaWinds mission. Release B also provides archive and distribution services for the Landsat 7 mission.

Releases C & D provide evolutionary enhancements to the ECS services provided in the earlier Releases.

This ICD provides the Release A and Release B implementations of the SCF-ECS interfaces. All interfaces in the ICD apply to both Release A and Release B unless the text explicitly states that an interface applies only to Release B. This ICD contains information pertaining to both Release A and Release B and is submitted to ESDIS as an update to the present ESDIS baseline ICD (reference document 505-41-40).

This document reflects the technical baseline maintained by the ECS Configuration Control Board in accordance with ECS technical direction (see Section 2.2).

1.3 Purpose and Objectives

This ICD defines the unique external interfaces between the ECS and SCFs as derived from the Level 3 requirements specified in the Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System and the Interface Requirements Document between EOSDIS Core System (ECS) and Science

Computing Facilities. This document is written to formalize the interpretation of the external interface between ECS and the SCFs to the extent necessary to assure hardware, software, and operational service compatibility within the end-to-end system. This ICD also provides a control point for the definition of external interfaces between ECS and the SCFs.

1.4 Status and Schedule

This ICD is submitted to NASA as a Configuration Control Board (CCB) approval code 1 document. At the Government's option, this document may be placed under full Government CCB control. Changes may be submitted at any time for consideration by Contractor and Government CCBs as part of the normal change process.

This ICD contains information pertaining to both Release A and Release B and is submitted to ESDIS as an update to the present ESDIS baseline ICD (reference document 505-41-40).

1.5 Organization

Section 1 introduces this document by providing its scope, purpose and objectives, ICD status and schedule, and document organization.

Section 2 lists the parent documents to which the interfaces in this ICD trace, the referenced documents that are directly applicable to this document, and information documents that may amplify or clarify information contained herein.

Section 3 provides an overview of the interfaces between ECS and the SCFs by summarizing the general functions of the interfaces, providing a diagram of the data flows, and describing the types of implementations that cover all external interfaces in this ICD.

Section 4 contains a description of the data exchange framework that applies to the detailed interface definitions in Section 5. Section 4 describes a brief operations concept, network topology, inter-networking protocols, Kerberized file transfers and ktelnet, the Distributed Computing Environment, ECS ingest requirements, the ECS Data Availability Notice, and Error Conditions.

Section 5 provides detailed definitions of each data flow including source, destination, interface method, contents, formats, expected volumes, and expected frequencies.

The Abbreviations and Acronyms in Appendix AB define all abbreviations and acronyms that appear herein.

Appendix A provides a tabular summary of the internal and external interfaces between ECS and the SCFs. Readers who are unfamiliar with this ICD are advised to read this appendix first, rather than last, because it provides a top-level view of all SCF interfaces.

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2. Related Documentation

2.1 Parent Documents

The following documents are the parents from which this document's scope and content derive:

193-208-SE1-001	Methodology for Definition of External Interfaces for the ECS Project
304-CD-002-002	Science Data Processing Segment (SDPS) Requirements Specification for the ECS Project
304-CD-003-002	Communications and System Management Segment (CSMS) Requirements Specification for the ECS Project
304-CD-005-001	Release B SDPS/CSMS System Requirements Specification for the ECS Project
423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the EOSDIS Core System (ECS)
505-10-20	Goddard Space Flight Center, System Interface Control Plan for the Earth Science Data and Information System (ESDIS) Project
505-41-12	Goddard Space Flight Center, Interface Requirements Document between EOSDIS Core System (ECS) and Science Computing Facilities

2.2 Applicable Documents

The following documents are referenced herein and are directly applicable to this document. In the event of conflict between any of these documents and this document, this document shall take precedence.

205-CD-002-002	Science User's Guide and Operations Procedure Handbook for the ECS Project, Part 4: Software Developers Guide to Preparation, Delivery, Integration and Test with ECS
311-CD-008-001	Release B Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project
210-TP-001-006	Technical Baseline for the ECS Project, 2/14/96
none	Goddard Space Flight Center, ECS Technical Direction No. 11, "PDR Technical Baseline," 12/6/94

2.3 Information Documents

The following documents, although not directly applicable, amplify or clarify the information presented in this document, but are not binding.

209-CD-001-003	Interface Control Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI)
209-CD-008-008	EOSDIS Core System Project Interface Control Document Between EOSDIS Core System (ECS) and the Goddard Space Flight Center (GSFC) Distributed Active Archive Center (DAAC)
209-CD-010-005	Interface Control Document Between the EOSDIS Core System (ECS) and the Langley Research Center (LaRC) Distributed Active Archive Center (DAAC) for the ECS Project
209-CD-021-002	Interface Control Document Between EOSDIS Core System (ECS) and the Alaska SAR Facility (ASF) Distributed Active Archive Center (DAAC)
209-CD-022-003	Interface Control Document Between EOSDIS Core System (ECS) and the Oak Ridge National Laboratory (ORNL) Distributed Active Archive Center (DAAC)
305-CD-002-002	Science Data Processing Segment (SDPS) Design Specification for the ECS Project
305-CD-003-002	Communications and System Management Segment (CSMS) Design Specification for the ECS Project
305-CD-005-001	Release A SDPS Client Subsystem Design Specification for the ECS Project
305-CD-009-001	Release A SDPS Ingest Subsystem Design Specification for the ECS Project
305-CD-020-002	Release B SDPS/CSMS Design Specification Overview for the ECS Project
305-CD-021-002	Release B SDPS Client Subsystem Design Specification for the ECS Project
305-CD-024-002	Release B SDPS Data Server Subsystem Design Specification for the ECS Project
305-CD-025-002	Release B SDPS Ingest Subsystem Design Specification for the ECS Project
305-CD-026-002	Release B SDPS Planning Subsystem Design Specification for the ECS Project

305-CD-027-002	Release B SDPS Data Processing Subsystem Design Specification for the ECS Project
305-CD-028-002	Release B SDPS Communication Subsystem Design Specification for the ECS Project
305-CD-029-002	Release B SDPS System Management Subsystem Design Specification for the ECS Project
305-CD-030-002	Release B GSFC DAAC Design Specification for the ECS Project
305-CD-031-002	Release B LaRC DAAC Design Specification for the ECS Project
305-CD-033-002	Release B EDC DAAC Design Specification for the ECS Project
305-CD-034-002	Release B ASF DAAC Design Specification for the ECS Project
305-CD-035-002	Release B NSIDC DAAC Design Specification for the ECS Project
305-CD-036-002	Release B JPL PO.DAAC Design Specification for the ECS Project
305-CD-037-002	Release B ORNL DAAC Design Specification for the ECS Project
305-CD-038-002	Release B System Monitoring and Coordination Center (SMC) Design Specification for the ECS Project
311-CD-002-004	Science Data Processing Segment (SDPS) Database Design and Database Schema Specification for the ECS Project [note: information document for Release A only]
313-CD-004-001	Release-A SDPS/CSMS Internal Interface Control Document for the ECS Project
313-CD-006-002	Release-B SDPS/CSMS Internal Interface Control Document for the ECS Project
333-CD-003-004	Release A SCF Toolkit Users Guide for the ECS Project
601-CD-001-004	Maintenance and Operations Management Plan for the ECS Project.
609-CD-001-001	Interim Release One (Ir1) Maintenance and Operations Procedures for the ECS Project
194-815-SI4-001	SDP Toolkit Primer for the ECS Project [available in HTML only on the ECS Data Handling System @ http://edhs1.gsfc.nasa.gov/]
170-WP-002-001	Thoughts on HDF-EOS Metadata for the ECS Project
175-WP-001-001	HDF-EOS Primer for Version-1 EOSDIS
505-41-17	IST Capabilities Document for the ECS Project

194-219-SE1-001	Goddard Space Flight Center, Interface Requirements Document Between EOSDIS Core System (ECS) and the NASA Science Internet (NSI)
CCSDS 641.0-B-l	Consultative Committee for Space Data Systems (CCSDS), Recommendation for Space Data System Standards: PVLSPEC - Parameter Value Language Specification, 5/92
ISO 7498	International Organization for Standardization, Basic Reference Model for Systems Interconnection
RFC 791	Postel, J.; Internet Protocol
RFC 793	Postel, J.; Transmission Control Protocol
RFC 821	Postel, J.; Simple Mail Transfer Protocol
RFC 822	Crocker, David H., Standard for the Format of ARPANET Text Messages
RFC 977	Lapsley, Phil; Network News Transfer Protocol
RFC 1510	Newman, C.; The Kerberos Network Authentication Service (V5)
none	HyperText Markup Language Specification Version 3.0, Internet Draft, D. Raggett
none	HyperText Transfer Protocol Version 1.0, Internet Draft. T. Berners-Lee, R. Fielding, H. Frystyk
none	The SSL Protocol, Version 3.0, Internet Draft, March, 1996, Alan O. Freier, Philip Karlton, and Paul C. Kocher
none	X Window System Protocol, X Version 11, Release 5, Robert W. Scheifler, Massachusetts Institute of Technology
none	X Window System: the Complete Reference to Xlib, X Protocol, ICCCM, XLFD, Robert W. Scheifler and James Gettys, Digital Press

3. Interface Overview

This section provides an overview of the SCF interfaces with ECS and DAACs by summarizing the general functions of the interfaces, providing a diagram of the data flows, and describing the types of implementation used to support all external interfaces.

3.1 Introduction

The SCF interfaces support science data production software development by the scientists at SCFs and support data processing and data reprocessing operations at the Distributed Active Archive Centers (DAACs) using SCF-developed science data production software. The SCF interfaces include the transfer of science data production software for both standard and special products, coefficients and SCF-generated ancillary data, science data product quality assurance information, and information about science data processing and reprocessing. Other interfaces support remote integration and test of SCF-developed science data production software. Figure 3.1-1 shows the external SCF interfaces that support development of data production software and support DAAC use of the SCF-developed software for processing and reprocessing of science data. Note that Figure 3.1-1 does not include interfaces between the ECS Release A Client or the ECS Ingest GUI (Graphical User Interface) residing on an SCF workstation and the DAAC servers. These interfaces, although specified in the ECS-SCF IRD, are considered ECS internal interfaces. Appendix A provides a table of all IRD-defined interfaces and an indication of internal or external implementation. Throughout this document, external SCF interfaces refer to the data flows shown in Figure 3.1-1.

3.2 Interface Implementation

Table 3.2-1 lists the types of implementation used to support the external SCF interfaces and the software that the SCFs are required to host for each interface implementation type. All Release A and Release B external interfaces with the SCFs are instances of a general interface type in this table. The interfaces normally involve human interaction and are not automated on the SCF side. Email messages from the SCFs to ECS and a DAAC are interactive while the email messages from ECS to the SCFs are machine generated. The manually-typed email messages from either an SCF or a DAAC are allowed to be in free form although necessary information must be included. The email messages do not include file attachments. This ICD specifies the types of information that manually-typed email messages must contain. ECS and DAAC operations personnel and SCFs will define further details about each email message as required. Table 3.2-1 provides a top-level view of the interface types that are elaborated in subsequent sections.

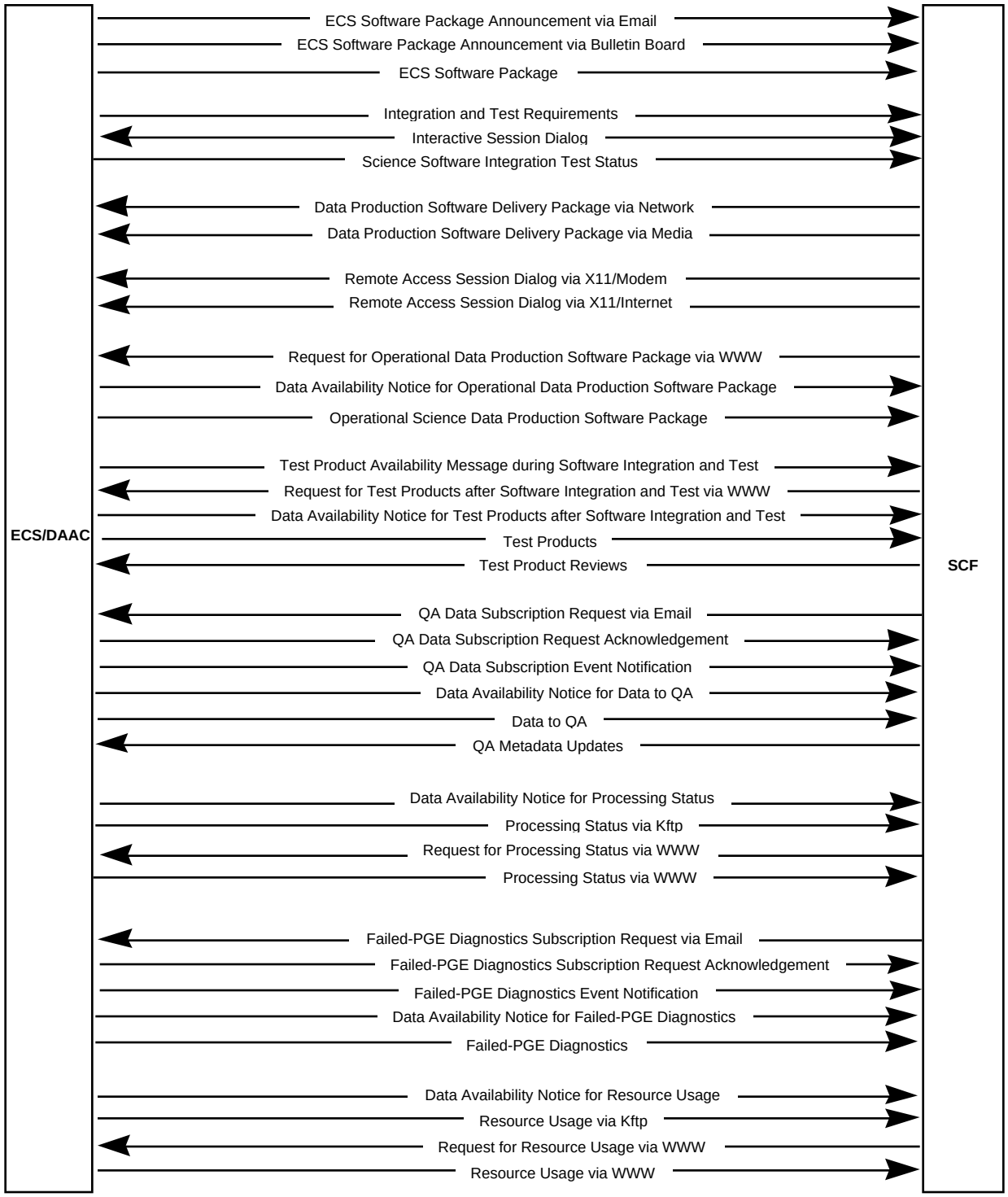

Figure 3.1-1. External SCF Interfaces (1 of 2)

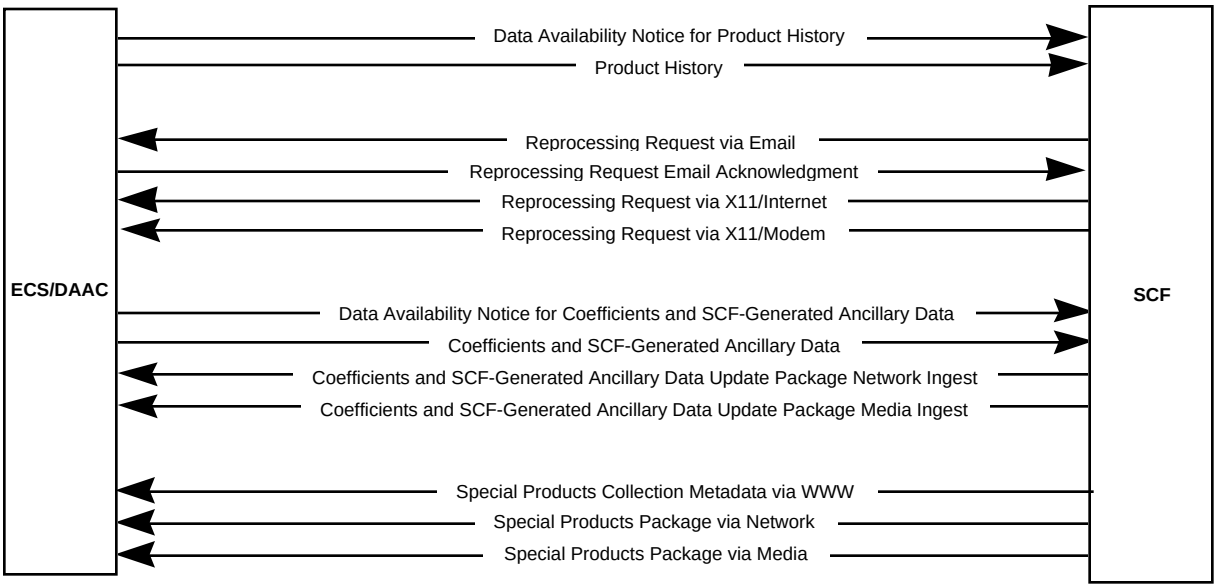

Figure 3.1-1. External SCF Interfaces (2 of 2)

Table 3.2-1. Software Requirements for Each Type of External ECS-SCF Interface

Interface Implementation Type	Required SCF Software
email	Workstation mail application
file transfer protocol (ftp)	Workstation Operating System and ftp software
Kerberized ftp (kftp)	Kerberos and Kerberos network utilities that are compliant with RFC 1510. Commercial support for Kerberos is recommended but not required.
Media Ingest	None (media delivery options include hand delivery and conventional mail)
World Wide Web (WWW)	WWW browser with forms capability (Netscape 2.0 is recommended) or ECS-provided desktop tool for Web interfaces

Secure WWW	WWW browser supporting Secure Socket Layer (SSL) Protocol Version 3.0 and Java 1.0 (Only in Release B)
X11 access to DAAC	Kerberos network utilities and X server (X11 Release 5) with Motif version 1.2.* in both Release A and Release B, where * represents a positive integer (also 28.8 kbps V.34 modem and associated software if Internet connection with DAAC is not used)
ECS Bulletin Board	News reader using the Network News Transfer Protocol (NNTP) (Only in Release B)

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4. Data Exchange Framework

Section 4 contains a description of the data exchange framework and the methods used for the external SCF interfaces. This section provides the general foundation upon which Section 5 detailed interface definitions are built. The section includes Brief Operations Concept, Network topology, Internetworking Protocols, Kerberized File Transfers and Telnet, the Distributed Computing Environment, ECS Ingest Requirements, ECS Data Availability Notice, and Error Conditions.

4.1 Brief Operations Concepts

Although operations concepts generally fall outside the scope of ICDs, this section is included in order to briefly

- Describe the internal interfaces (that are outside the scope of this ICD).
- Explain that data flows from the SCF to ECS via kftp (data ingest) can use either put or get (i.e., “push” or “pull”).
- Explain that SCFs nominally obtain data from ECS via kftp by getting or pulling the data from ECS. (Exception: SCFs acting as general users can have the data put or pushed to their local computer by choosing that option when ordering via the Release A Client or the Release B DCE Client.)
- Summarize the interactions during typical SCF-related subscriptions and data retrievals.

No attempt has been made to provide operations concepts for all interfaces in this ICD, and definition of general-user scenarios goes beyond the scope of the SCF IRD and this ICD.

4.1.1 Internal Interfaces

This section summarizes the internal interfaces, which consist of the use of ECS-developed and ECS-provided clients that reside on an SCF machine (the Release A Client, the Release B DCE Client, and the ECS Ingest GUI). The ECS Ingest GUI is used by the SCF to request ingest (reference 305-CD-009-001 and 305-CD-025-002). The ECS Release A and Release B DCE Clients are used to order data via network and hard media. The ECS Release B DCE Client is used to enter subscriptions in the Release B time frame. (Email is used to enter subscriptions in Release A.)

4.1.2 Data Ingest via Kftp

Authorized SCFs use the Ingest GUI to initiate ingest of SCF data into ECS (reference Section 4.6) by specifying either kftp put or get. The Ingest GUI gives authorized users options to 1)

place the data to be ingested into a directory within an SCF computer from which ECS can pull the data or 2) put the data into a directory within an ECS computer.

4.1.3 Subscriptions and Kftp Retrieval of Archived Data

Figure 4.1.3-1 shows three data flows that are related to subscriptions and three data flows for data order and delivery. This operations concept applies to Releases A and B for SCF-ECS and SCF-DAAC flows.

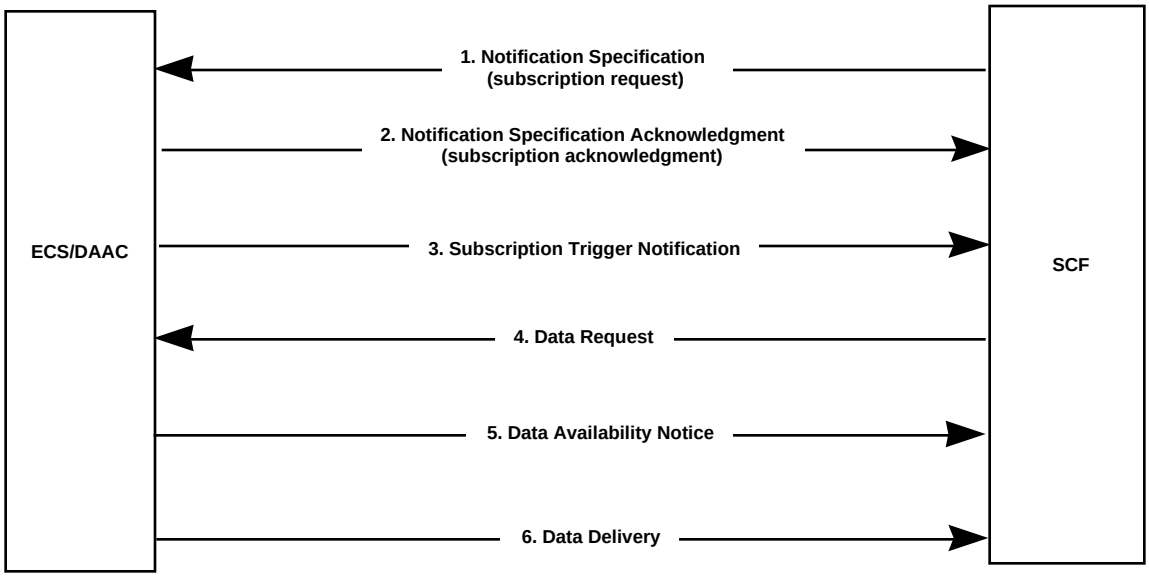


Figure 4.1.3-1. Operations Concept for Subscriptions and Data Retrieval

In Flow 1 the SCFs enter a subscription by specifying the events that trigger notifications. For example, the event that specified new data have been archived or the event that specified metadata parameters have changed could trigger a notification that the SCF should consider conducting Quality Assurance (QA) of science data. Flow 2 is an acknowledgment by ECS that the SCF successfully entered its subscription via Flow 1. After receiving a QA-related Subscription Trigger Notification (Flow 3), SCFs might decline to conduct QA related to this subscription. In that case Flows 4 through 6 would be unneeded.

If an SCF decides to request the data that were identified in Flow 3 or any other data, the SCF would enter a data request (Flow 4) including a specification of the delivery mechanism. Figure 4.1.3-1 assumes network delivery as the usual distribution mechanism although SCFs can also function as general users who order data on hard media. That data request could be made for all of the data specified in Flow 3, for only some of the data, or for some data in Flow 3 and other data not in Flow 3. After ECS has placed the requested data on an ECS staging disk, ECS informs the SCF with the necessary information (Flow 5) in a Data Availability Notice that includes file names and locations for obtaining the data. The SCF can obtain some or all of the staged data via the kftp get in Flow 6.

Many variations on this operations concept are available to SCFs and other users. For example, subscriptions can specify data distribution via media and via an automated kftp push to an SCF computer in one step rather than using Steps 4-6 as suggested herein. The many possible scenarios for subscriptions and data distribution are bounded only by the capabilities of the Release B DCE Client, which will be fully documented by the time of its delivery to users.

4.2 Network Topology

The network connectivity between SCFs and the DAACs is illustrated in Figure 4.2-1.

SCF computers generally reside on a non-ECS local area network (LAN), referred to here as the SCF Campus Network. As examples, CERES SCF resources at LaRC reside on the LaRC campus network, and SCF resources located at a university reside on the university's network.

Further information about the network connections between ECS and NSI can be found in the interface control document between EOSDIS Core System (ECS) and NSI.

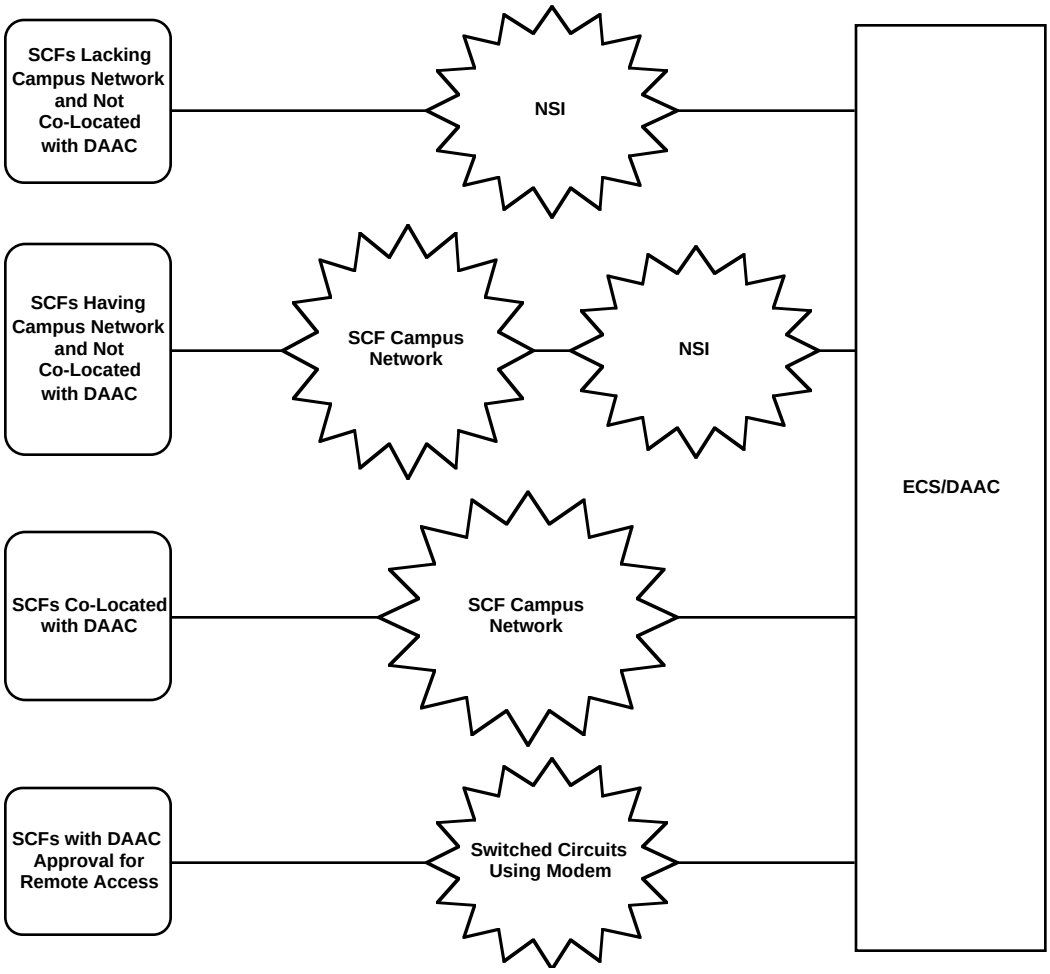


Figure 4.2-1. DAAC-SCF Network Connectivity Diagram

4.3 Internetworking Protocols

ECS-SCF internetworking services are based on protocols and standards corresponding to the Open System Interconnect (OSI) reference model. These specifications are published in International Organization for Standardization, Basic Reference Model for Systems Interconnection (reference ISO 7498).

The Transport Layer protocols used for ECS-SCF communication consist of the Transport Control Protocol (TCP), specified in RFC 793, which provides for guaranteed delivery of data. The Network Layer protocol used for ECS-SCF communication is the Internet Protocol (IP) specified in RFC 791.

All electronic mail messages are Internet electronic mail messages as defined by the Simple Mail Transfer Protocol (SMTP) (RFCs 821 and 822). SMTP runs over TCP using TCP port number 25 and a 7-bit ASCII format.

ECS uses HyperText Markup Language (HTML), Version 3.0 protocols in interfaces that are summarized as WWW. HTML is a simple markup language used to create hypertext documents that are portable from one platform to another. HTML documents are Standard Generalized Markup Language documents with generic semantics that are appropriate for representing information from a wide range of applications. The protocols for HTML are defined in HyperText Markup Language Specification Version 3.0. HTML, Version 3.0 is backwards compatible with HTML 2.0. The HyperText Transfer Protocol (HTTP) is an application-level protocol from the WWW. The basic version of HTTP is defined in the HyperText Transfer Protocol, Version 1.0, Internet-Draft. This document also defines status codes, which can include error information, that are returned as a result of transferring information via HTTP.

4.4 Kerberized File Transfers and Telnet

Kerberos is a network authentication system defined by RFC 1510. Although the Distributed Computing Environment (DCE) is optional for SCFs, all SCFs must host a Kerberos client and Kerberos network utilities whether or not they also host a DCE client as discussed in Section 4.5. ECS requires the SCFs to host a Kerberos client and Kerberos network utilities that are compliant with the Kerberos Network Authentication Service (Version 5) as described in RFC 1510 (e.g., Cygnus CNS V5 [96Q1] using default settings or MIT v5b6 with Message Digest [MD4] flags set to “off”) in both the Release A time frame and the Release B time frame. ECS recommends, but does not require, purchase of Kerberos from commercial venders. ECS will provide support to SCFs for installation and use of Kerberos.

Kerberized telnet (ktelnet) is a Kerberos network utility that is required only for SCFs that have DAAC approval for remote access of specified DAAC-operator interfaces. Other SCFs do not need ktelnet.

SCFs hosting Kerberos with the Kerberos network utilities have the capability to use all SCF interfaces in Release A whether or not those SCFs also host a DCE client.

4.5 Distributed Computing Environment

A standardized processing environment, Open Software Foundation's DCE is optionally used between the SCF workstations and the ECS. SCFs choosing to implement DCE are required to obtain and install DCE client software (Version 1.0.3 or compatible in the Release A time frame and Version 1.1 or compatible in the Release B time frame). The SCF can either be part of a DAAC DCE cell or, with the addition of DCE server software, can be part of an SCF DCE cell using intercell communications to the DAAC cell. Communications use TCP/IP over the NSI or LAN/WAN connections to the DAAC.

Further information about DCE can be found on the WWW using the following URL:

http://www.osf.org/dce/qna/

SCFs without DCE clients in the Release A time frame can use all Release A internal and external interfaces as defined in this ICD. In the Release B time frame, SCFs without DCE clients can use the external interfaces as defined in the body of this ICD. In addition to those external interfaces, Table A-1 specifies internal interfaces that use the Release B DCE Client, which requires SCFs to have DCE clients installed on any workstation using the Release B DCE Client. (Other SCF workstations are not required to have DCE clients.) However, SCFs can obtain these functions by 1) continuing their use of the older Release A Client in the Release B time frame, 2) using a WWW Client as described in the body of this ICD, or 3) using the manual email interface in the case of QA Notification Specification (subscriptions). The Release A Client, the WWW Client, and email options do not require DCE clients.

4.6 ECS Ingest Requirements

The ingest interfaces consist of 'Science Data Production Software Delivery Packages' and 'Coefficients and SCF-Generated Ancillary Data Packages' in Releases A and B and 'Special Products Packages' in Release B.

Science Data Production Software Delivery Packages can include few or many components included within the major categories of computer code (UNIX scripts, and C, FORTRAN 77 or FORTRAN 90, or ADA source code), data (coefficients and SCF-generated ancillary data, control files, test data, expected test results, and PGE activation rules), and documents. SCFs can send Science Data Production Software Delivery Packages to a DAAC for ingest either via hard media or network. In both cases, the SCF is allowed to "tar" the entire package except for the metadata and delivery record files. The purpose of the delivery record file is to provide machine-readable information about each delivered file. Deliveries include at least three electronic files (delivery record, metadata, and one or more data files that may optionally be tar'd). ECS validates the package by examining the contents of the metadata file. The files on a tape or other hard media can be written in any order according to the SCF's discretion.

The delivery record file contains information that is required for automated ingest. This electronic file contains some, but not all, of the information in the delivery memo (reference Science User's Guide and Operations Procedure Handbook for the ECS Project, Part 4: Software

Developers Guide to Preparation, Delivery, Integration and Test with ECS) that accompanies each delivery package. In the case of network ingest in the Release A time frame, SCFs manually prepare the delivery record files. In the Release B time frame, the need to prepare a delivery record file is transparent to the SCF personnel who complete forms in the ECS Ingest GUI to request network ingest. In Release B this GUI prepares a delivery record file that summarizes information provided by the SCF about the requested ingest. The GUI sends the delivery record to ECS as part of the network ingest.

In the case of media ingest in Release B, the ECS Ingest GUI can also be used to prepare and save a delivery record file. However, the user must copy the delivery record file to the hard media that also contains a metadata file and at least one other file (that optionally may be tar'd). By this use of the ECS Ingest GUI, SCFs can prepare the required delivery record file without needing to structure the required information according to the Parameter Value Language (PVL) that ECS expects.

Each metadata file and delivery record file consists of a series of Parameter Value Language (PVL) statements of the form PARAMETER=Value and terminated by a semicolon. Blanks, carriage returns, line feeds, tabs, and form feeds are allowed (ignored in ECS ingest) for human readability. Statements are terminated by ";". Comments are also ignored and are initiated by "/*" and terminated by "*/". PVL statements may occupy multiple lines. A complete PVL specification can be found in the document PVLSPEC - Parameter Value Language Specification (CCSDS 641.0-B-1). This specification and a PVL tutorial are available on the WWW in the CCSDS Documents Library at

http://ddwilson.gsfc.nasa.gov/CCSDS-A.html

by requesting a keyword search on "PVL."

Tables 4.6-1 and 4.6-2 define the format and contents of the delivery record and metadata files, respectively, that must be included in all science data production software delivery packages. Table 4.6-3 defines the contents of the metadata file that must accompany Coefficients and SCF-Generated Ancillary Data. Table 5.14-1 defines Special Product metadata for data granules. The Ingest GUI does not provide SCFs with a tool for preparation of these metadata files in PVL form.

SCFs are required to prepare for ingest by applying to DAAC operations for an ingest user account. As part of that application process the SCF and DAAC operations will exchange information including the following:

1. SCF selection of one of the options for ingest: 1) kftp "push" by SCF or 2) kftp "pull" by ECS.
2. ECS assignment of directory locations to the SCF. The SCF will kftp put the delivery record files into that location and may optionally put other data there if the SCF selected the "push" option in number 1.
3. Set up of Kerberos keys and passwords, etc. in support of the kftp data flows during ingest.

Release A and Release B DAACs will support media ingest via 4 and 8 mm tapes.

4.7 ECS Data Availability Notice

ECS sends an email DAN to an SCF to announce that requested data files have been staged at ECS for pull by the SCF via kftp. The DAN as defined in Table 4.7-1 provides the information that is necessary for the SCF to accomplish the kftp get. In this message each statement consists of PARAMETER = VALUE , "/*", an explanatory text field, and "*/;". The explanatory text field consists of the information in the Description column of Table 4.7-1. Table 4.7-2 illustrates the appearance of a typical DAN.

4.8 Error Conditions

Errors may occur during use of the email, ftp/kftp, WWW, and X11 interfaces in this ICD. SCFs are strongly urged to promptly notify DAAC operations or other appropriate organization in order to hasten the correction of abnormal conditions that cause the errors. Delay in problem notification could delay the resolution of the problem. Table 4.8-1 details categories of errors and the corresponding actions that should be undertaken to avoid, mitigate, or correct those errors.

Table 4.6-1. Delivery Record PVL Parameters and Values

Parameter	Description	Type	Format/ Max Size (Bytes)	Values
ORIGINATING_SYSTEM	User name and SCF name (to identify source of delivery)	Variable String	ASCII (64 B)	Free text
OBJECT	Start of file group parameters (repeat for each group of files)	Fixed String	ASCII (10 B)	'FILE_GROUP'
DATA_TYPE	Earth Science Data Type (ESDT) or metadata class of the files in this group (N.B. Algorithm package can include coefficients and other data, documentation, and code. The values for types of guide, browse granules, and data granules apply only to Release B Special Products. Angle brackets <> are used to enclose ESDT names that will be assigned after a special product has been proposed and approved.)	Variable String	ASCII (50 B)	'Delivered Algorithm Package' 'Regional Area Definition Guide' 'Archive Center Guide' 'Processing Center Guide' 'Data Originator Guide' 'Field Campaign Guide' 'Platform Guide' 'Instrument Guide' 'ECS Collection Guide' 'Sensor Guide' 'Non Instrument Guide' <ESDT for browse granule> <ESDT for data granule>
OBJECT	Start of file parameters (repeat for each file)	Fixed String	ASCII (9 B)	'FILE_SPEC'
NODE_NAME	Name of network node on which the file resides (if network ingest)	Variable String	ASCII (64 B)	'None' (if file on media) or name (e.g., 'shark.hitc.com')
DIRECTORY_ID	File directory location (i.e., a path name)	Variable String	ASCII (See Note 1)	directory
FILE_ID	File name	Variable String	ASCII (See Note 1)	file name
FILE_SIZE	Length of file in bytes	Unsign-ed 32 bit Integer	ASCII (10 B)	$< 4.295*10^9$

END_OBJECT	End of file parameters (repeat for each file)	Fixed String	ASCII (9 B)	'FILE_SPEC'
END_OBJECT	End of file group parameters (repeat for each DATA_TYPE/group of files)	Fixed String	ASCII (10 B)	'FILE_GROUP'

Note 1. Size does not exceed a total of 256 bytes when DIRECTORY_ID and FILE_ID are combined. Size limit excludes the null terminator

Table 4.6-2. Required Metadata for Data Production Software Delivery Package

Parameter	Description	Type	Format/ Max Size (Bytes)	Values
OBJECT	Start of statements for a class	Fixed String	ASCII (5 B)	'CLASS'
OBJECT	The name of an ECS Object Class	Variable String	ASCII (50 B)	'DeliveredAlgorithmPackage'
OBJECT	The start of attributes for the class	Fixed String	ASCII (10 B)	'ATTRIBUTES'
AlgorithmPackageName	This attribute is the name given to the complete delivered package submitted for algorithm integration and test.	Fixed String	ASCII (80 B)	Free text
AlgorithmPackageVersion	This attribute specifies the version of the package being delivered.	Fixed String	ASCII (20 B)	Alphanumeric characters in the form 'major.minor' or 'xxxxxxxxxxxxxx.xxxx'
AlgorithmPackageMaturityCode	This specifies the maturity of the algorithm package as a whole. Maturity code plus version number tells version state.	Fixed String	ASCII (20 B)	'pre-launch' 'preliminary' 'operational' 'stable' 'final'
LongName	Name of the data product to whose production this package contributes	Fixed String	ASCII (32 B)	Free text. Reference: list of data products in latest version of the ECS Technical Baseline
ShortName	The official reference name of the data product to whose production this package contributes. ShortName and LongName both refer to the same data product.	Fixed String	ASCII (8 B)	Free text. Reference: list of data products in latest version of the ECS Technical Baseline
END_OBJECT	Marks end of attributes for the class	Fixed String	ASCII (10 B)	'ATTRIBUTES'
END_OBJECT	Marks end of the 'DeliveredAlgorithmPackage'	Variable String	ASCII (50 B)	'DeliveredAlgorithmPackage'
END_OBJECT	Marks end of the Class	Fixed String	ASCII (5 B)	'CLASS'

Table 4.6-3. Required Metadata for Coefficients and SCF-Generated Ancillary Data Update Package

Parameter	Description	Type	Format/ Max Size (Bytes)	Value
OBJECT	Start of statements for a class	Fixed String	ASCII (5 B)	'CLASS'
OBJECT	The name of an ECS Object Class	Variable String	ASCII (50 B)	'Coeff&SCFAncData'
OBJECT	The start of attributes for the class	Fixed String	ASCII (10 B)	'ATTRIBUTES'
PlatformShort Name	Acronym, abbreviation, or short name assigned to the platform carrying the instruments	Fixed String	ASCII (20 B)	Free text. Reference Mission Baseline in latest ECS Technical Baseline
SensorShort Name	Acronym, abbreviation, or short name by which the sensor is commonly known	Fixed String	ASCII (20 B)	Free text. Reference Mission Baseline in latest ECS Technical Baseline
Coeff&SCFAnc DataName	The name of a particular package of Coefficients and SCF-Generated Data submitted for algorithm integration and test	Variable String	ASCII (80 B)	Free text
ReleaseDate	The date of a particular release and version of Coefficients and SCF-Generated Data	Variable String	ASCII (20 B)	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals.
VersionNumber	The version number of a particular release of Coefficients and SCF-Generated Data	Variable String	ASCII (20 B)	1-20 printable characters
END_OBJECT	Marks end of attributes for the class	Fixed String	ASCII (10 B)	'ATTRIBUTES'
END_OBJECT	Marks end of the Coefficients and SCF-Generated Data	Fixed String	ASCII (10 B)	'Coeff&SCFAncData'
END_OBJECT	Marks end of the Class	Fixed String	ASCII (5 B)	'CLASS'

Table 4.7-1. DAN PVL Parameters and Values

Parameter	Description	Type	Format/ Max Size (Bytes)	Values
REQUEST_TYPE	Examples: 'Test Products' 'Product History'	Variable String	ASCII (32 B)	'Operational Data Production S/W' 'Test Products' 'Data to QA' 'Processing Status' 'Resource Usage' 'Product History' 'Coefficients & SCF-Gen Ancillary'
EXPIRATION_TIME	ISO Time when data may be deleted from ECS staging area	Fixed String	ASCII (20 B)	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
OBJECT	Start of file group parameters (repeat for each group of files)	Fixed String	ASCII (10 B)	'FILE_GROUP'
NODE_NAME	Name of ECS workstation containing data	Variable String	ASCII (64 B)	e.g., shark.hitc.com
GRANULE_ID	UR uniquely identifying a particular data granule	Variable String	ASCII (325 B)	As declared by ECS at time of data insertion
OBJECT	Start of the parameters for a file (repeat for each file)	Fixed String	ASCII (9 B)	'FILE_SPEC'
DIRECTORY_ID	File directory location without file name	Variable String	ASCII (see Note 1)	directory
FILE_ID	File name without directory	Variable String	ASCII(see Note 1)	file name
END_OBJECT	End of file parameters (repeat for each file)	Fixed String	ASCII (9 B)	'FILE_SPEC'
END_OBJECT	End of file group parameters (repeat for each group of files)	Fixed String	ASCII (10 B)	'FILE_GROUP'

Note 1. Size does not exceed a total of 256 bytes when DIRECTORY_ID and FILE_ID are combined. Size limit excludes the null terminator

Table 4.7-2. Sample Data Availability Notice for Two Files

REQUEST_TYPE = 'Data to QA'	/* Examples: 'Test Products' 'Product History' */;
EXPIRATION_TIME = 2001-11-12T20:00:00Z	/* ISO Time when data may be deleted from ECS staging area */;
OBJECT = FILE_GROUP	/* Start of the parameters for a file group (repeat for each group of files) */;
NODE_NAME = lis.computer.com	/* Name of ECS workstation containing data */;
GRANULE_ID = <GranuleUR>	/* UR uniquely identifying a particular data granule */
OBJECT = FILE_SPEC	/* Start of file specifications for file */ ;
DIRECTORY_ID = /dir1	/* File directory location without file name */;
FILE_ID = trmm.lis.2-1.1999.063.0012	/* File name without directory */;
END_OBJECT = FILE_SPEC	/* End of file parameters (repeat for each file) */;
OBJECT = FILE_SPEC	/* Start of file specifications for 1 file */ ;
DIRECTORY_ID = /dir1	/* File directory location without file name */;
FILE_ID = trmm.lis.2-1.1999.063.0013	/* File name without directory */ ;
END_OBJECT = FILE_SPEC	/* End of file parameters (repeat for each file) */;
	/* Add more file specifications here if more than 2 files are staged */;
END_OBJECT = FILE_GROUP	/* End of parameters for a group of files. Repeat as necessary */;

Table 4.8-1. Error Conditions and Associated Actions (1 of 2)

Error Condition	Action by SCF or DAAC
Non delivery of manually-sent and manually-read email message	If receipt of original email massage is critical, include a request for manual receipt acknowledgment when sending the original message. Generate that acknowledgment request automatically if the email package in use supports that option.
Non delivery of subscription event notice related to QA or failed PGEs	Embed an SCF toolkit call in PGE to notify DAAC operator about subscription event if the criticality of the subscription event justifies manual intervention
Non delivery of email DAN for requested data	1. SCF should use Release A Client or Release B DCE Client to request status of data order once an excessive time[1] has passed after the data request was submitted. 2. SCF should notify DAAC staff of failure to receive DAN if status of data request is available or if the data already have been removed from the kftp user pull area. 3. SCF should re order the data if the data already have been removed from the kftp user pull area. 4. Returned non deliverable email messages are routed to DAAC operations to verify the email address via a voice telephone call to the data requester at the SCF.
Data transmission errors during kftp or ftp	Normally transparent to user but extreme problems could necessitate a repeated request of the transfer after a network problem has been eliminated.
1. Unable to establish connection	SCF should attempt to isolate the problem by pinging to check for an active DAAC host and notify the DAAC.
2. Connection broken	SCF should repeat the transfer request and should notify the local or campus network manager if the problem recurs and either network is involved.
3. High bit error rate	SCF should repeat the transfer request and should notify the local or campus network manager if the problem recurs and either network is involved.

Table 4.8-1. Error Conditions and Associated Actions (2 of 2)

Ktelnet or X11 error	Depending on whether the SCF uses Internet, Internet and campus network, or telephone lines, the SCF should notify the appropriate person of errors.
1. Unable to establish connection via telephone	SCF should notify telephone company if unable to reach the DAAC. Notify DAAC staff if unable to actually establish connection with DAAC including no answer and consistent busy signal from modems. Retry if no problem is identified that needs correction or after problem correction.
2. Unable to establish Internet connection	SCF should attempt to isolate the problem by pinging to check for an active DAAC host and notify the DAAC.
3. X11 connectivity not allowed by router filter	SCF should contact DAAC to verify that the SCF host is a valid host for X11 traffic.
4. Connection broken	SCF should notify telephone or network person about problem and attempt to reconnect.
5. High bit error rate	SCF should notify telephone or network person about problem and reconnect.
WWW error:	
1. Unable to connect to Internet service provider or loss of connection	SCF should notify Internet provider of problem
2. Unable to connect to Web server or loss of connection	SCF should notify a Web server administrator of problem.

Note 1. “Excessive time” depends on time of day and the nature of the data order. Only crude guidelines can be provided and the guidelines assume that only one file is ordered. Orders for multiple files take longer to fulfill but applicable guidelines are not provided herein. Orders are normal or challenging with challenging defined as orders for data from multiple ESDTs, for time periods of weeks or longer, or for non continuous time periods. Normal orders are orders that are not challenging. Excessive wait times for orders consisting of only one file are estimated as the following under specified conditions:

1. Longer than 10 minutes from 3:00 A.M. to 9:00 A.M. Eastern Time for normal data requests.

2. Longer than 30 minutes from 9:00 A.M. to 3:00 A.M. Eastern time for normal data requests.

3. Weeks or longer for challenging orders that are received at any time.

5. Data Flows

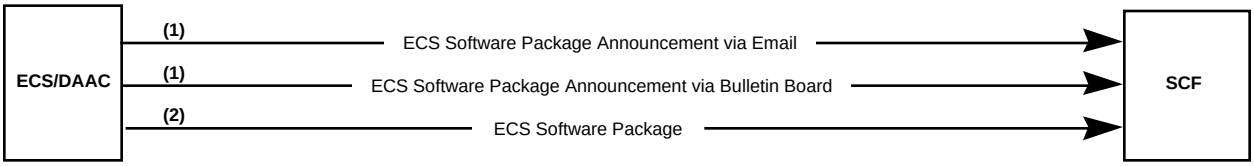
Section 5 builds upon the general foundation that the Data Exchange Framework that Section 4 provides. The following sections provide detailed descriptions of each data flow between the ECS and SCFs (excluding those between ECS servers and the ECS-provided software that are resident on SCF computers). Figure 3.1-1 shows the external interfaces, and Table A-1 (in Appendix A) summarizes all interfaces including internal interfaces. The interfaces defined in Section 5 apply to both Release A and Release B unless otherwise specified. Subsequent sections describe the functional purpose of each flow and specify the following additional information about the flow:

- The system that initiates the flow
- How the data are delivered
- How frequently the flow occurs. This includes flows from all SCFs that coexist with a particular ECS release rather than flow frequency for a typical SCF.
- Data volume/sizing estimates

Additional qualitative information describing the data flows in this section can be found in the Science User's Guide and Operations Procedure Handbook for the ECS Project, Part 4: Software Developers Guide to Preparation, Delivery, Integration and Test with ECS.

5.1 ECS Software Package External Interfaces

Figure 5.1-1 shows the ECS Software Package Interfaces



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.1-1. ECS Software Package Interfaces

5.1.1 ECS Software Package Announcement via Email

This message, which applies to both Release A and Release B, duplicates the announcement in Section 5.1.2 except for omission of directions on how to request to be added to the list of authorized recipients of this email message and the ECS software.

This interface consists of an email message sent by ECS (the Systems Monitoring and Coordination Center [SMC]) staff to all SCFs to inform the SCFs that an ECS software package is available for their pickup from ECS using password-protected ftp. The package announcements pertain to both the initial package announcement and announcements of subsequent updates. The SMC staff initiates this email flow after receiving authorization by ESDIS.

Table 5.1.1-1 defines the message format and content for both releases.

Table 5.1.1-1. Description of ECS Software Package Announcement via Email

Data Flow Characteristic	Release A and Release B Description
Source	ECS Staff
Destination	SCF
Interface Method	email (SMTP)
Contents	Internet address (presently edhs1.gsfc.nasa.gov or 192.150.28.25), the group, password, detailed directions for obtaining and installing the software, the total file size, and a list of the available files
Format	Free form mail message to be read by a human
Expected Volume	< 10 KB
Expected Frequency	2/year

5.1.2 ECS Software Package Announcement via Bulletin Board

This external interface, which applies only to Release B, provides SCFs with notices about the availability of ECS software and directions for obtaining that software. Those directions also specify how an SCF can request to be added to the list of authorized users of the interfaces in Sections 5.1.1 and 5.1.3. SCFs must receive the ECS Software Package Announcement via Email before obtaining the software package. SCFs and other users obtain ECS Software Package Announcements via bulletin board by using news reader software to access the ECS Bulletin Board. Although this interface can be accessed by any news reader using NNTP, the Release B DCE Client also gives access to the bulletin board. Table 5.1.2-1 defines the announcement format and content.

Table 5.1.2-1. Description of ECS Software Package Announcement via Bulletin Board

Data Flow Characteristic	Release B Description
Source	ECS
Destination	SCF
Interface Method	NNTP
Contents	Determined by each announcement

Format	ASCII
Expected Volume	10 KB
Expected Frequency	2 per year per authorized recipient

5.1.3 ECS Software Package

The ECS Software Package for Releases A and B includes the SCF Toolkit, Local Data Access Service, and any other software that ECS provides to the SCFs, including the Release A Client and the ECS Ingest GUI. The SCF toolkit contains the tools that the SCF needs to develop science data production software for use by ECS. The toolkit delivery includes the SCF version of the Toolkit, which includes tools for generic input/output, status message facility, process control, geolocation, and coordinate system conversion. (Refer to the latest SCF Toolkit Users Guide for the ECS Project for details.)

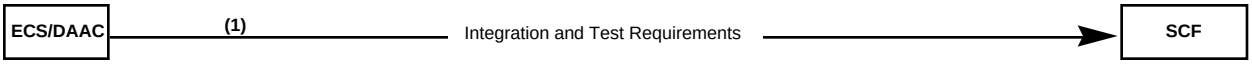
The format and content of the ECS Software Packages are defined in Table 5.1.3-1. The SCF initiates the ftp flow.

Table 5.1.3-1. Description of ECS Software Package

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	Password-protected ftp get by the SCF
Contents	SCF Toolkit and other software
Format	tar or compressed tar
Expected Volume	1 GB
Expected Frequency	2/year

5.2 Science Software Integration and Test Requirements External Interface

Figure 5.2-1 shows the Science Software Integration and Test Requirements interface.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.2-1. Science Software Integration and Test Requirements Interface

5.2.1 Integration and Test Requirements

Section 5-8 of the Software Developer's Guide to Preparation, Delivery, Integration and Test with ECS (DID 205, Part 4) provides the integration and test requirements for science data production software. However, the indicated Science Software Integration and Test Procedures Document between each DAAC and Instrument Team takes precedence over DID 205, Part 4.

Release A and Release B SCFs can electronically access this document on the WWW.

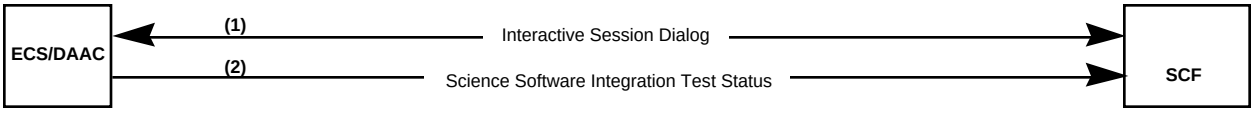
The format and content of the data flow are defined in Table 5.2.1-1.

Table 5.2.1-1. Description of Integration and Test (I&T) Requirements

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	Present WWW URL: http://edhs1.gsfc.nasa.gov/misc/docsw/docswcat.html (Scroll to document number 205-CD-002-002)
Contents	Software Developer's Guide to Preparation, Delivery, Integration and Test with ECS (DID 205, Part 4)
Format	ASCII, RTF, ps, or pdf
Expected Volume	1.5 MB if Postscript. Less for other formats
Expected Frequency	2/year by SCFs

5.3 Interactive Session Dialog External Interfaces

Figure 5.3-1 shows the Interactive Session Dialog Interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.3-1. Interactive Session Dialog Interfaces

5.3.1 Interactive Session Dialog

This external interface applies to both Release A and Release B. The dialog between DAAC or ECS staff and the SCFs consists of various email and voice messages exchanged between the science software integration and test personnel and the SCF investigator team during the science

software integration and test process. This dialog takes place in support of the integration and test process of data production software.

The format and content of the email messages are defined in Table 5.3.1-1.

Table 5.3.1-1. Description of Interactive Session Dialog

Data Flow Characteristic	Release A and Release B Description
Source	Either (1) DAAC or ECS staff or (2) SCF
Destination	Either (1) SCF or (2) DAAC or ECS staff
Interface Method	email (SMTP)
Contents	Technical and science issues, operations support, integration and test status, test coordination including requests for the following: I&T status information, results of tests, test execution scripts, and solutions to minor problems.
Format	Free form mail message to be read by humans
Expected Volume	< 10 KB (per message)
Expected Frequency	1000/year

5.3.2 Science Software Integration and Test Status

This interface allows SCFs to use Kerberized ftp to pull Science Software Integration and Test log files from ECS if the DAAC has not used email to provide the SCF with the test status. Use of this interface must follow an SCF request for Science Software Integration and Test Status while using the email interface for Interactive Session Dialog.

The format and content of the integration and test status files are defined in Table 5.3.2-1.

Table 5.3.2-1. Description of Science Software Integration and Test Status

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	Log files from testing of SCF-developed data production software
Format	ASCII
Expected Volume	1 MB
Expected Frequency	Daily to Weekly

5.4 Data Production Software Delivery Package External Interfaces

Figure 5.4-1 shows the Data Production Software Delivery Package Interfaces.

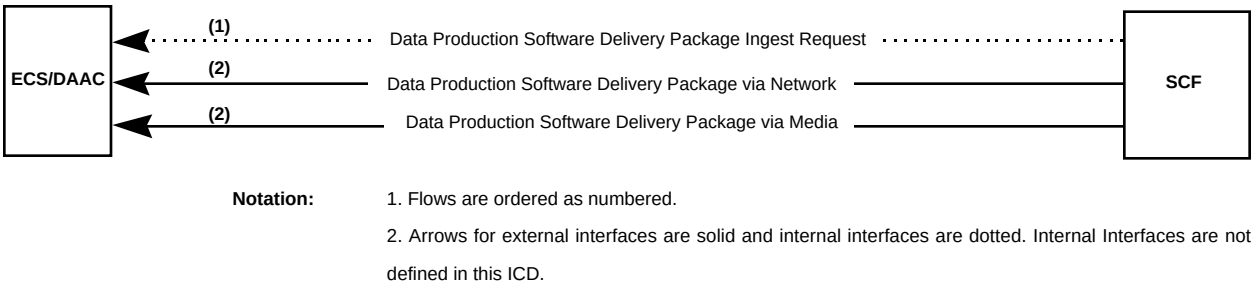


Figure 5.4-1. Data Production Software Delivery Package Interfaces

5.4.1 Data Production Software Delivery Package via Network

The SCFs use this Kerberized ftp interface to electronically deliver or update a Science Data Production Software Delivery Package, whose contents are governed by the Science User's Guide and Operations Procedure Handbook for the ECS Project, Part 4: Software Developers Guide to Preparation, Delivery, Integration and Test with ECS. However, for particular SCF-DAAC pairs, the procedures documents to which those pairs agree take precedence over DID 205, Part 4. This software delivery from the SCF to the DAAC consists of the files that the SCF specifies by using the ECS Ingest GUI.

The format and content of the interface are defined in Table 5.4.1-1. Media ingest can be used as an alternative delivery mechanism.

5.4.2 Data Production Software Delivery Package via Media

The SCFs use this interface to deliver a Science Data Production Software Delivery Package or update on media. Section 4.6 specifies the media types that can be ingested.

The format and content of the interface are defined in Table 5.4.2-1.

Table 5.4.1-1. Description of Data Production Software Delivery Package via Network

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	ECS
Interface Method	kftp
Contents	General contents as specified in Software Developer's Guide to Preparation, Delivery, Integration and Test with ECS (DID 205, Part 4) and particular files as requested for ingest by the SCF via the ECS Ingest GUI. However, for particular SCF-DAAC pairs, the procedures documents to which those pairs agree take precedence over DID 205, Part 4.

Format	Code: ASCII, 32-bit binary, 64-bit binary Data: HDF-EOS, HDF, 32-bit binary, 64-bit binary, ASCII Documents: rtf, ps, pdf, HTML Other: All files, except for metadata and delivery record files, optionally may be tar'd (machine readable)
Expected Volume	Depends on number and the size of the components in the package
Expected Frequency	2/month

Table 5.4.2-1. Description of Data Production Software Delivery Package via Media

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	DAAC
Interface Method	Media ingest
Contents	General contents as specified in Software Developer's Guide to Preparation, Delivery, Integration and Test with ECS (DID 205, Part 4) and particular files as specified in the delivery record file (also on same media). However, for particular SCF-DAAC pairs, the procedures documents to which those pairs agree take precedence over DID 205, Part 4.
Format	Code: ASCII, 32-bit binary, 64-bit binary Data: HDF-EOS, HDF, 32-bit binary, 64-bit binary, ASCII Documents: rtf, ps, pdf, HTML Other: All files, except for metadata and delivery record files, optionally may be tar'd (machine readable)
Expected Volume	Depends on number and the size of the components in the package
Expected Frequency	2/month

5.5 Remote Access Session Dialog External Interfaces

SCFs can use these interfaces at DAAC discretion in both Release A and Release B to carry out remote integration and test of their science data production software in DAAC test environments. If the DAAC authorizes use of these interfaces, an SCF member can remain physically located at the SCF while using an SCF machine for interactive access to the following software that is running at the DAAC:

- The Science Data Processing Toolkit with DAAC extensions (reference SDP Toolkit Primer for the ECS Project)
- The planning and data processing user interfaces (references: Release-A SDPS Planning Subsystem Design Specification and Release B SDPS Planning Subsystem Design Specification for the ECS Project)
- Test and execution analysis tools (reference Interim Release One (Ir1) Maintenance and Operations Procedures and subsequent M&O procedures documents for Release A and Release B)

These interfaces require use of Kerberized telnet, X Window System (X11 protocol), and Motif. These interfaces also require connection via Internet or via dial up modems using switched circuits. SCF and DAAC routers provide further security by restricting access to a list of authorized SCF and DAAC host addresses and ports as established during the process by which

the SCF obtains DAAC approval for remote I&T access. The SCF must have 1) one or more modems for the dial up option or 2) a router/firewall for the Internet option.

The DAAC provides authorized SCFs with information including the following:

- Setup instructions for the DAAC I&T application through which the SCF can access all I&T tools
- The unix command for invoking that DAAC I&T application.
- The modem telephone numbers (if the SCF intends to use that option)

Figure 5.5-1 shows the Remote Access Session Dialog Interfaces.

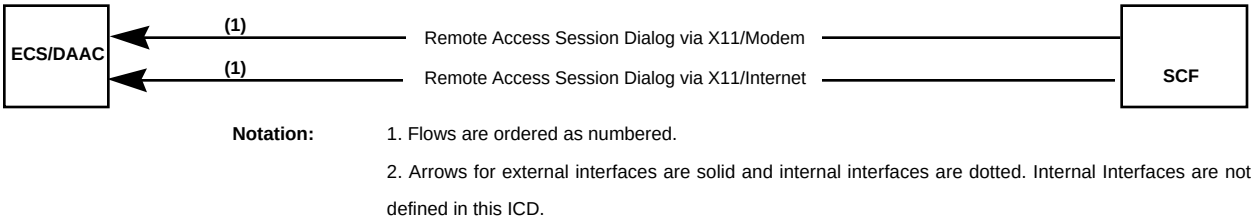


Figure 5.5-1. Remote Access Session Dialog Interfaces

5.5.1 Remote Access Session Dialog via X11/Modem

The format and content of the interface are defined in Table 5.5.1-1.

Table 5.5.1-1. Description of Remote Access Session Dialog via X11/Modem

Data Flow Characteristic	Release A and Release B Description
Source	SCF (SCF initiates the session. Data flows in both directions during the session.)
Destination	DAAC
Interface Method	28.8 kbps V.34 modem Ktelnet (Kerberos Version 5 as defined by RFC 1510) X server (X11 Release 5) Motif version 1.2.*, where the * represents a positive integer
Contents	Determined by the contents of the GUIs that the SCF access
Format	Determined by X11 protocol
Expected Volume	Depends on user's use of the interface
Expected Frequency	Daily sessions by approved SCFs during periods of active I&T and rare otherwise.

5.5.2 Remote Access Session Dialog via X11/Internet

The format and content of the interface are defined in Table 5.5.2-1.

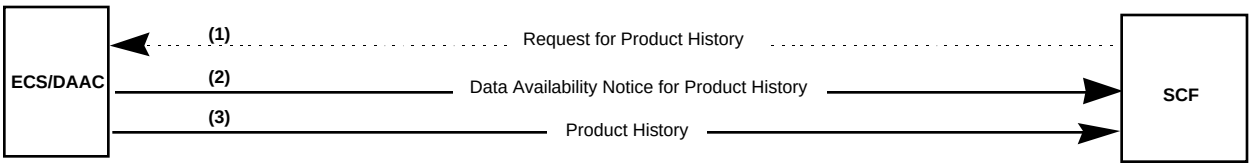
Table 5.5.2-1. Description of Remote Access Session Dialog via X11/Internet

Data Flow Characteristic	Release A and Release B Description
Source	SCF (SCF initiates the session. Data flows in both directions during the session.)
Destination	DAAC
Interface Method	Internet connectivity via an SCF fire wall/router Ktelnet (Kerberos Version 5 as defined by RFC 1510) X server (X11 Release 5) Motif version 1.2.*, where the * represents a positive integer
Contents	Determined by the contents of the GUIs that the SCF access
Format	Determined by X11 protocol
Expected Volume	Depends on user's use of the interface
Expected Frequency	Daily sessions by approved SCFs during periods of active I&T and rare otherwise.

5.6 Operational Data Production Software Package External Interfaces

During the time of software integration and test, each delivered Science Data Production Software Delivery Package may be changed before becoming accepted for routine operational use in data production. These interfaces enable SCFs to obtain a copy of the Operational Science Data Production Software Package that results from those changes.

Figure 5.6-1 shows the Operational Data Production Software Package interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.6-1. Operational Data Production Software Package Interfaces

5.6.1 Request for Operational Data Production Software Package via WWW

This Release A and Release B interface provides a WWW page for SCFs to request Operational Data Production Software Packages. SCFs optionally can make the request using the Release B

DCE Client during the Release B time frame. Table 5.6.1-1 describes the form and content of this message.

Table 5.6.1-1. Description of Request for Operational Data Production Software Package

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	ECS
Interface Method	WWW Browse, URL depending on Instrument, PGE, PGE version
Contents	not applicable (WWW browser selections)
Format	HTML
Expected Volume	40 KB
Expected Frequency	4/year

5.6.2 Data Availability Notice for Operational Data Production Software Package

This interface notifies the SCF that a requested Operational Data Production Software Package is available for transfer from ECS via kftp. The data availability notice is defined in Section 4.7.

The format and content of the email messages are defined in Table 5.6.2-1.

Table 5.6.2-1. Description of Data Availability Notice for Operational Data Production Software Package

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1.
Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	10 KB
Expected Frequency	4/year

5.6.3 Operational Science Data Production Software Package

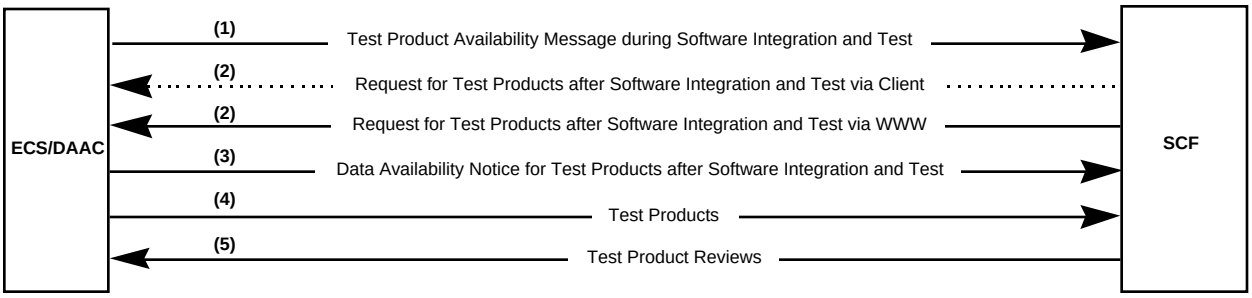
The SCFs use this interface to electronically pull a copy of an Operational Science Data Production Software Delivery Package. The format and content of the data flows are defined in Table 5.6.3-1.

Table 5.6.3-1. Description of the Operational Science Data Production Software Package

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp
Contents	Code: ASCII, 32-bit binary, 64-bit binary Data: HDF-EOS, HDF, 32-bit binary, 64-bit binary, ASCII Documents: rtf, ps, pdf, HTML Other: All files, except for metadata and delivery record files, optionally may be tar'd (machine readable)
Format	tar, ASCII, rtf, ps, pdf, HTML, binary executables, octal, hex (machine readable)
Expected Volume	Depends on the size of the package as delivered and as modified during integration and test
Expected Frequency	4/year

5.7 Results of Testing External Interfaces

Figure 5.7-1 shows the Results of Testing Interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.7-1. Results of Testing Interfaces

5.7.1 Test Product Availability Message during Software Integration and Test

This and the following email interface give the SCF instructions for obtaining test results. This manual email interface applies before the test results are archived by ECS. A DAAC operator sends this availability message after receiving a email request for test results. That email request is part of the Interactive Session Dialog.

The format and content of this Test Product Availability Message are defined in Table 5.7.1-1.

Table 5.7.1-1. Description of Test Product Availability Message During Software Integration and Test

Data Flow Characteristic	Release A and Release B Description
Source	DAAC
Destination	SCF
Interface Method	email (SMTP)
Contents	Suggested contents may be modified by DAAC operator: number of staged files, the total bytes, DAN sequence number, expiration time, ECS data types, staging machine name, directory IDs, file names, and file sizes
Format	free form message to be read by a human
Expected Volume	10 KB
Expected Frequency	Daily to Weekly

5.7.2 Request for Test Products after Software Integration and Test via WWW

After the software integration and test process, Test Products can be requested using this Release A and Release B WWW interface. SCFs optionally can make the same request using the Release B DCE Client during the Release B time frame.

The format and content of this request are defined in Table 5.7.2-1.

Table 5.7.2-1. Description of Request for Test Products after Software Integration and Test

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	ECS
Interface Method	WWW Browse, URL depending on Instrument, PGE, PGE version
Contents	not applicable (WWW browser selections)
Format	HTML
Expected Volume	40 KB
Expected Frequency	Monthly

5.7.3 Data Availability Notice for Test Products after Software Integration and Test

This interface gives the SCF instructions for obtaining test results after the SCF has requested that information using either the WWW interface or the Release B DCE Client. This interface applies after the test results are archived by ECS.

The format and content of the DAN are defined in Table 5.7.3-1.

Table 5.7.3-1. Description of Data Availability Notice for Test Products after Software Integration and Test

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1
Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Monthly

5.7.4 Test Products

This Kerberized ftp interface enables SCFs to pull test products from ECS. SCFs use this interface after receiving one of two possible notices: one manually sent by a DAAC operator before the software has completed its integration and test process, and the other (a DAN) automatically sent by ECS after integration and test.

The format and content of the data flow are defined in Table 5.7.4-1.

Table 5.7.4-1. Description of the Test Products

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	As specified by SCF's test plan
Format	ASCII
Expected Volume	2 TB (maximum)
Expected Frequency	60/year

5.7.5 Test Product Reviews

The Test Product Reviews interface exists in both Releases A and B and enables SCFs to send a free form email message to the DAAC containing the SCF's review of the test products. This review is likely to be used in documentation of the I&T process by the I&T team. The format and content of the email messages are defined in Table 5.7.5-1.

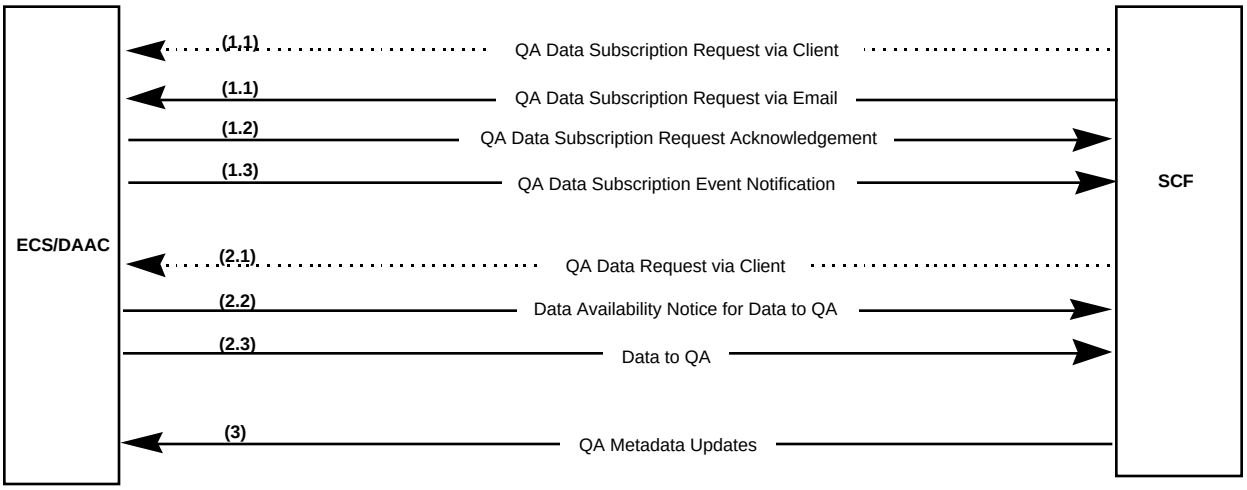
Table 5.7.5-1. Description of Test Product Reviews

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	DAAC

Interface Method	email (SMTP)
Contents	SCF's QA review of the test results
Format	Free form message to be read by a human
Expected Volume	< 10 KB
Expected Frequency	60/year

5.8 QA External Interfaces

Figure 5.8-1 shows the QA Interfaces.



Notation:
1. Flows are ordered as numbered. Typically the subscription-related interfaces are used before the data-related interfaces. And metadata typically are updated after subscribing to and ordering data.
2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.8-1. QA Interfaces

5.8.1 QA Data Subscription Request via Email

This QA subscription interface exists in both Releases A and B. Use of this interface is optional in Release B because SCFs can also use the Release B DCE Client, which is not covered in this section because it is an internal interface. Use of the Release B DCE Client is recommended because some functionality is lost by reliance upon this email interface. The Client allows specification of event qualifiers, which may sharply reduce the frequency of undesired subscription triggering.

This interface allows SCFs to enter a QA data subscription request by sending an email message to the DAAC. This interface supports cancellation of existing subscriptions by re submitting the original subscription and including the optional cancellation line. This subscription specifies that ECS should notify the SCF when either of two triggering events occurs.

The format and content of the email messages are defined in Tables 5.8.1-1 and 5.8.1-2.

Table 5.8.1-1. Description of QA Data Subscription Request via Email

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	DAAC
Interface Method	email (SMTP)
Contents	• Subject of email message • ECS username • notification text • <ESDT> • event • start date • expiration date • optional cancellation and as defined in Table 5.8.1-2.
Format	As defined in Table 5.8.1-2
Expected Volume	< 10 KB
Expected Frequency	2/year

Table 5.8.1-2. Contents of QA Data Subscription Request via Email

Content Category	Description	Type	Format/ Max Size (bytes)	Value or Content with Value
Subject of email message	Subject of message identifies the type of subscription being requested	Fixed String	ASCII (80 B)	'QA Data Subscription Request'
Note: the following rows define the body of the email message.				

ECS userid	SCF user's name as assigned by ECS at the time of the user's registration with ECS.	Fixed String	ASCII (20 B) [1]	'ECS userid: <userid>' where userid[2] consists of 8 alphabetic or numeric characters.
notification text	SCF-provided text describing the subscription that is being requested. Text should distinguish this subscription relative to all other subscriptions (both past and future) that the SCF might submit. This text also will be returned to the SCF within each notification that the subscription has fired.	Variable String	ASCII (256 B including 227 B of free text at right) [1]	'notification text: <free text>' [2]
ESDT	Short name of Earth Science Data Type	Fixed String	ASCII (16 B including 10 B for <ESDT>) [1]	'ESDT: <ESDT>' [2]
event	Release A subscription events consist of granule insertion ('insert') and metadata update ('update'). Release B events also include QA metadata changes, new version of granule, and a daily, weekly, or monthly timer. Typical use of this interface is expected to heavily rely on the QA metadata changes event (although all enumerated events are available to SCFs). The metadata changes event is triggered whenever a PGE sets the ScienceQualityFlag metadata attribute to the value 'being investigated.' Because the software developer controls the setting of that flag, this subscription event triggers whenever conditions occur that in the developer's judgment may merit investigation (manual QA) at the SCF. This event is SCF defined. In both releases only one event is specified in each subscription.	Fixed String	ASCII (29 B) [1]	'event: insert' 'event: update' 'event: QA metadata changes' 'event: new version of granule' 'event: daily timer' 'event: weekly timer' 'event: monthly timer'

start date	Instruction for subscription to begin on and include the specified start date.	Fixed String	ASCII (22 B) [1]	'start date: YYYY/MM/DD'
expiration date	Instruction for subscription to include and end on the specified expiration date.	Fixed String	ASCII (27 B) [1]	'expiration date: YYYY/MM/DD'
cancel	optional command to cancel the subscription that was defined by the above rows of this table	Fixed String	ASCII (6 B)	'cancel'

Note 1. This field length includes a content category, a colon, 1 blank, and a value string.

Note 2. Angle brackets ("<" and ">") enclose user-provided information (userid, ESDT, and free text).

5.8.2 QA Data Subscription Request Acknowledgment

This subscription acknowledgment interface exists in both release A and Release B. The interface enables DAAC operators to confirm receipt of a QA subscription from the SCF. These email messages are defined in Tables 5.8.2-1 and 5.8.2-2.

Table 5.8.2-1. Description of QA Data Subscription Request Acknowledgment

Data Flow Characteristic	Release A and Release B Description	
Source	DAAC	
Destination	SCF	
Interface Method	email (SMTP)	
Contents	Reply to message requesting subscription. Retain original request message and append the following on separate line as defined by Table 5.8.2-2: 'status of subscription request: accepted'	
Format	As defined by Table 5.8.2-2. Normally sent and read by a human	

Expected Volume	< 10 KB	
Expected Frequency	2/year	

Table 5.8.2-2. Contents of QA Data Subscription Request Acknowledgment

Content Category	Description	Type	Format/Max Size (Bytes)	Content with Value
status of subscription request	DAAC operator either specifies the subscription status as 'accepted' by ECS or uses free text to explain the reason why the subscription was not accepted.	Variable String	ASCII (256 B) [2]	'status of subscription request: accepted' or 'status of subscription request: <free text>' [3]

Note 1. This table defines contents in addition to the contents of the preceding request message.

Note 2. This field length includes a content category, a colon, 1 blank, and a value string.

Note 3. Angle brackets ("<" and ">") enclose ECS-provided information (UR) and user-provided information (free text) whose values are determined when this interface is in use.

5.8.3 QA Data Subscription Event Notification

This Release A and Release B interface enables ECS to automatically notify the SCF upon all occurrences of the event to which the SCF subscribed using the QA Data Subscription Request interface. The notification is an ECS-generated email message with format and content that are defined in Table 5.8.3-1.

Table 5.8.3-1. Description of QA Data Subscription Event Notification

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	<notification text>; <granule UR> (Notes: the notification text was provided by the SCF when requesting the subscription and is echoed in this message. Also, the <granule UR> is the universal reference for the granule that triggered the subscription.)
Format	The < notification text> is a 226 Byte variable ASCII string, and the <granule UR> is a 325 byte fixed ASCII string. Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Daily

5.8.4 Data Availability Notice for Data to QA

This email message from ECS notifies the SCF that data for QA have been staged following a request via the Release A Client or the Release B DCE Client. The format and content of the DAN are defined in Table 5.8.4-1.

Table 5.8.4-1. Description of Data Availability Notice for Data Delivered for QA

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1
Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Daily

5.8.5 Data to QA

Via this interface SCFs can pull data that require manual QA by the SCF staff. The format and content of the data flow are defined in Table 5.8.5-1.

Table 5.8.5-1. Description of Data Delivered for QA

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	All or part of the staged data as specified in a previous DAN

Format	HDF
Expected Volume	75 GB (maximum)
Expected Frequency	Daily

5.8.6 QA Metadata Updates

Via this Release A and Release B interface, the SCF can update the QA metadata for reviewed products by using a WWW form that is accessible via WWW browser. The form allows the SCF to enter the values for science QA metadata for one or more science products.

The format and content of the data flow are defined in Table 5.8.6-1.

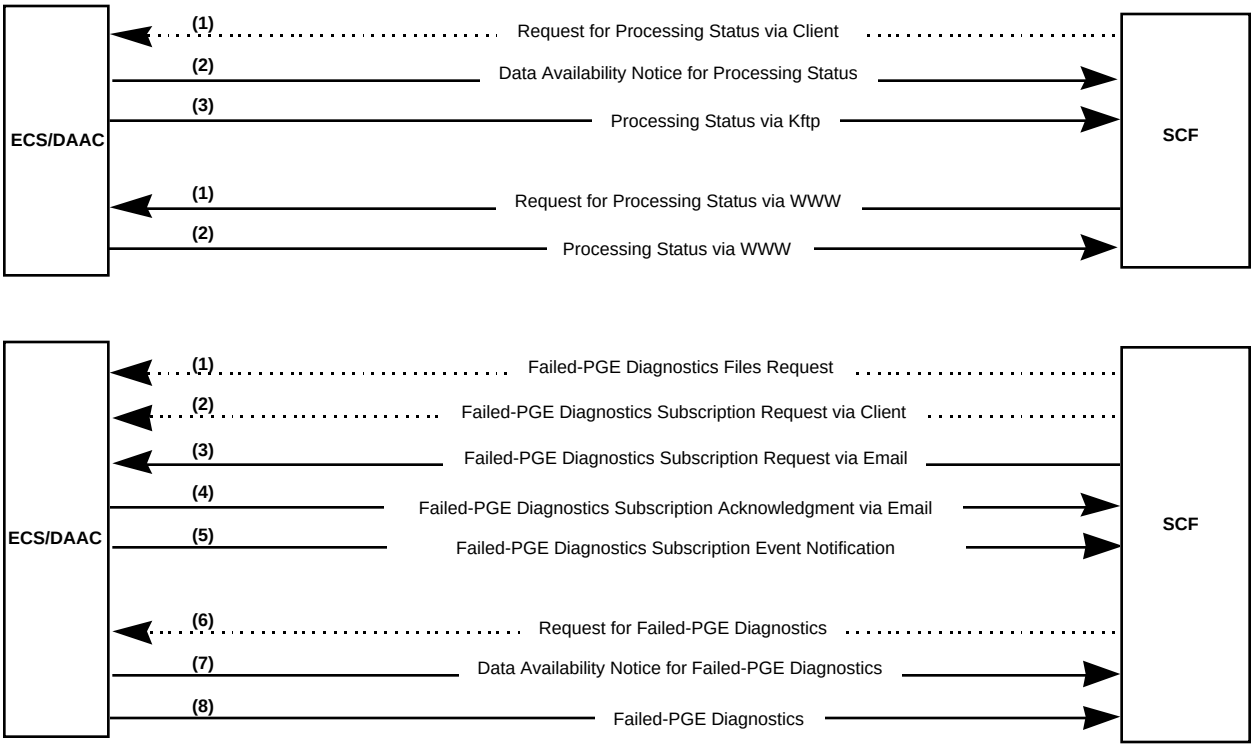
Table 5.8.6-1. Description of Request for QA Metadata Updates

Data Flow Characteristic	Release A Description	Release B Description
Source	SCF	SCF
Destination	ECS	ECS
Interface Method	WWW	Secure WWW (Browser supporting Secure Socket Layer [SSL] Protocol Version 3.0 and Java 1.0)
Contents	QA Metadata Values	QA Metadata Values
Format	HTML	HTML
Expected Volume	<10 KB	<10 KB
Expected Frequency	Daily	Daily

5.9 Processing Status and Diagnostics External Interfaces

The interfaces in this section enable SCFs to obtain 1) the status of production requests for a specified instrument and time period (Sections 5.9.1 through 5.9.4) and 2) diagnostics for PGEs that terminate abnormally during processing or reprocessing (Sections 5.9.5 through 5.9.9).

Figure 5.9-1 shows the Processing Status and Diagnostics interfaces.



Notation: 1. Flows are ordered as numbered in the Figure within both the upper status part and the lower diagnostics part.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.9-1. Processing Status and Diagnostics Interfaces

5.9.1 Data Availability Notice for Processing Status

This Release B email message from ECS notifies the SCF that product processing status information has been staged following a request via the Release B DCE Client. The format and content of the DAN are defined in Table 5.9.1-1.

Table 5.9.1-1. Description of Data Availability Notice for Processing Status

Data Flow Characteristic	Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1

Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.9.2 Processing Status via Kftp

This Release B interface allows the SCF to obtain the status of product processing via kftp from ECS after receipt of a Data Availability Notice. The format and content of the kftp data flow are defined in Table 5.9.2-1. This interface also provides status after reprocessing.

Table 5.9.2-1. Description of Processing Status via Kftp

Data Flow Characteristic	Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	All or part of the staged data as specified in a previous DAN
Format	ASCII
Expected Volume	100 KB
Expected Frequency	Weekly

5.9.3 Request for Processing Status via WWW

This Release A and Release B WWW interface permits the SCF to request current processing status from ECS. The format and content of the interface are defined in Table 5.9.3-1.

Table 5.9.3-1. Description of Request for Processing Status via WWW

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	ECS
Interface Method	WWW
Contents	Not applicable (WWW Browse selections)
Format	HTML
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.9.4 Processing Status via WWW

This Release A and Release B interface provides the requested processing status to the SCF via WWW, in response to the WWW access request. This interface includes status of reprocessing. The format and content of the data flow are defined in Table 5.9.4-1.

Table 5.9.4-1. Description of Processing Status via WWW

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	WWW
Contents	Processing Status Report
Format	ASCII
Expected Volume	100 KB
Expected Frequency	Weekly

5.9.5 Failed-PGE Diagnostics Subscription Request via Email

This diagnostics subscription interface exists in both Releases A and B. Use of this interface is optional in Release B because SCFs can also use the Release B DCE Client, which is not covered in this section because it is an internal interface.

This interface allows SCFs to enter a failed-PGE diagnostics subscription by sending an email message to the DAAC. This message specifies that ECS should notify the SCF about all insertions of new diagnostics data for a particular Earth Science Data Type (ESDT) while the subscription remains in effect. This interface supports cancellation of existing subscriptions by re submitting the original subscription and including the optional cancellation line. A subscription fires many times if a long duration is specified for the subscription and the PGE contains defects.

Use of this interface typically follows use of the SCF Toolkit to make a Failed-PGE Diagnostics Files Request, which, as an internal interface, is not defined herein except for general information in this paragraph. Files can be requested by use of the PGS_SMF_SendRuntimeData tool per the latest version of Document Number 333-CD-003-XXX, Release A SCF Toolkit Users Guide, where XXX denotes the Guide's version number. A Release B toolkit and associated documentation may become available in the future, but neither is presently authorized. SCFs use the PGS_SMF_SendRuntimeData toolkit tool by embedding suitable calls in each SCF-developed PGE. If the SCF does not use this optional tool, the Failed-PGE Diagnostics files default to the Failed PGE History and the core dump, if available.

The format and content of the email messages are defined in Tables 5.9.5-1 and 5.9.5-2.

Table 5.9.5-1. Description of Failed-PGE Diagnostics Subscription via Email

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	DAAC
Interface Method	email (SMTP)
Contents	• Subject of email message • ECS username • notification text • <ESDT> • event • start date • expiration date • optional cancellation And as defined in Table 5.9.5-2.
Format	As defined in Table 5.9.5-2.
Expected Volume	< 10 KB
Expected Frequency	Depends on the number of PGEs for which SCFs enter subscriptions

Table 5.9.5-2. Contents of Failed-PGE Diagnostics Subscription Request via Email

Content Category	Description	Type	Format/ Max Size (bytes)	Value or Content with Value

Subject of email message	Subject of message identifies the type of subscription being requested	Fixed String	ASCII (80 B)	'Failed-PGE Diagnostics Subscription Request'
Note: the following rows define the body of the email message.				
ECS userid	SCF user's name as assigned by ECS at the time of the user's registration with ECS.	Fixed String	ASCII (20 B) [1]	'ECS userid: <userid>' where userid consists of 8 alphabetic or numeric characters.
notification text	SCF-provided text describing the subscription that is being requested. Text should distinguish this subscription relative to all other subscriptions (both past and future) that the SCF might submit. This text also will be returned to the SCF within each notification that the subscription has fired.	Variable String	ASCII (256 B including 227 B of free text at right) [1]	'notification text: <free text>'
ESDT	Short name of Earth Science Data Type of the diagnostic data set	Fixed String	ASCII (16 B including 10 B for <ESDT>) [1]	'ESDT: <ESDT>'
event	Subscriptions to diagnostics are required to specify the event for insertion of new data.	Fixed String	ASCII (29 B) [1]	'event: insert'
start date	Instruction for subscription to begin on and include the specified start date.	Fixed String	ASCII (22 B) [1]	'start date: YYYY/MM/DD'
expiration date	Instruction for subscription to include and end on the specified expiration date.	Fixed String	ASCII (27 B) [1]	'expiration date: YYYY/MM/DD'
cancel	optional command to cancel the subscription that was defined by the above rows of this table	Fixed String	ASCII (6 B)	'cancel'

Note 1. This field length includes a content category, a colon, 1 blank, and a value string.

5.9.6 Failed-PGE Diagnostics Subscription Request Acknowledgment

This subscription acknowledgment interface exists in both Release A and Release B. The interface enables DAAC operators to confirm to the SCF that a subscription for diagnostics was received from the SCF. These email messages are defined in Tables 5.9.6-1 and 5.9.6-2.

Table 5.9.6-1. Description of Failed-PGE Diagnostics Subscription Request Acknowledgment

Data Flow Characteristic	Release A and Release B Description
Source	DAAC
Destination	SCF
Interface Method	email (SMTP)
Contents	Reply to the message requesting a subscription. Retain the original request message and append the following on a separate lines as defined by Table 5.9.6-2: 'status of subscription request: accepted'
Format	As defined by Table 5.9.6-2. Normally sent and read by a human
Expected Volume	< 10 KB
Expected Frequency	Depends on the number of PGEs for which SCFs enter subscriptions

Table 5.9.6-2. Contents of Failed-PGE Diagnostics Subscription Request Acknowledgment[1]

Content Category	Description	Type	Format/Max Size (Bytes)	Content with Value
status of subscription request	DAAC operator either specifies the subscription status as 'accepted' by ECS or uses free text to explain the reason why the subscription was not accepted.	Variable String	ASCII (256 B) [2]	'status of subscription request: accepted' or 'status of subscription request: <Free text>'

Note 1. This table defines contents in addition to the contents of the preceding request message.

Note 2. This field length includes a content category, a colon, 1 blank, and a value string.

5.9.7 Failed-PGE Diagnostics Subscription Event Notification

This Release A and Release B interface enables ECS to automatically notify the SCF whenever diagnostics for a failed PGE have been archived. The notification is an ECS-generated email message with format and content that are defined in Tables 5.9.7-1.

Table 5.9.7-1. Description of Failed-PGE Diagnostics Subscription Event Notification

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	<notification text>; <granule UR> (Notes: the notification text was provided by the SCF when requesting the subscription and is echoed in this message. Also, the <granule UR> is the universal reference for the granule that triggered the subscription.)
Format	The < notification text> is a 226 Byte variable ASCII string, and the <granule UR> is a 325 byte fixed ASCII string. Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Depends on SCF use of subscriptions, the duration of each subscription, and the maturity of the PGEs being processed

5.9.8 Data Availability Notice for Failed-PGE Diagnostics

This email message from ECS notifies the SCF that failed-PGE diagnostics data have been staged following a request via the Release A Client or the Release B DCE Client. The format and content of the DAN are defined in Table 5.9.8-1.

Table 5.9.8-1. Description of Data Availability Notice for Failed-PGE Diagnostics

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1
Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Depends on SCF use of subscriptions, the duration of each subscription, and the maturity of the PGEs being processed

5.9.9 Failed-PGE Diagnostics

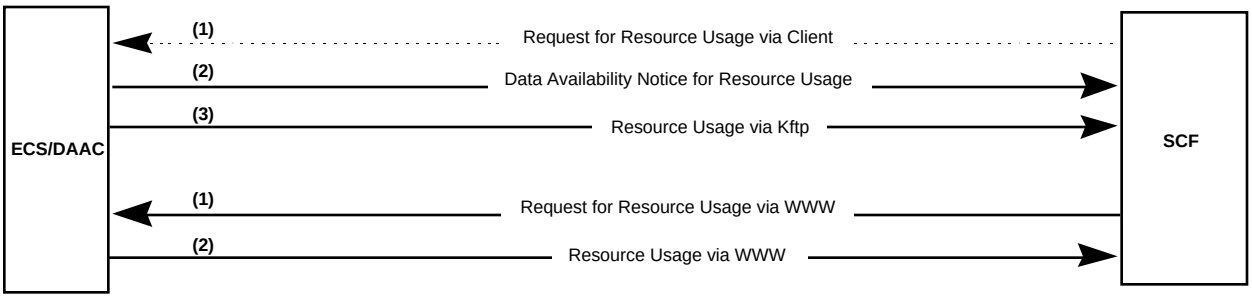
Via this interface SCFs can pull Failed-PGE Diagnostics. The format and content of the data flow are defined in Table 5.9.9-1.

Table 5.9.9-1. Description of Failed-PGE Diagnostics

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	The file that was specified in the preceding DAN
Format	tar
Expected Volume	Depends on the diagnostics files that the SCF selects
Expected Frequency	Depends on SCF use of subscriptions, the duration of each subscription, and the maturity of the PGEs being processed

5.10 Resource Usage External Interfaces

Figure 5.10-1 shows the Resource Usage interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.10-1. Resource Usage Interfaces

5.10.1 Data Availability Notice for Resource Usage

This Release B email message from ECS notifies the SCF that Resource Usage information has been staged following a request via the Release B DCE Client. The format and content of this DAN are defined in Table 5.10.1-1.

Table 5.10.1-1. Description of Data Availability Notice for Resource Usage

Data Flow Characteristic	Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1

Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.10.2 Resource Usage via Kftp

This Release B interface allows SCFs to obtain Resource Usage information from ECS following receipt of a Data Availability Notice. The format and content of the data flow are defined in Table 5.10.2-1.

Table 5.10.2-1. Description of Resource Usage via Kftp

Data Flow Characteristic	Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	All or part of the staged data as specified in a previous DAN
Format	ASCII
Expected Volume	100 KB
Expected Frequency	Weekly

5.10.3 Request for Resource Usage via WWW

This Release A and Release B interface permits the SCF to request resource usage data from ECS. The format and content of the interface are defined in Table 5.10.3-1.

Table 5.10.3-1. Description of Request for Resource Usage via WWW

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	ECS
Interface Method	WWW
Contents	Not Applicable (WWW Browse selections)
Format	HTML
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.10.4 Resource Usage via WWW

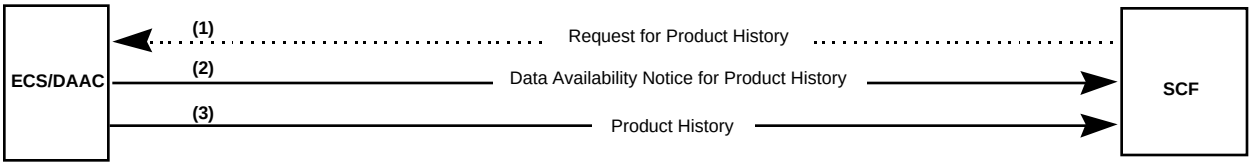
This Release A and Release B interface provides the requested Resource Usage information to the SCF. The format and content of the data flow are defined in Table 5.10.4-1.

Table 5.10.4-1. Description of Resource Usage via WWW

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	WWW
Contents	Resource Usage Report
Format	ASCII
Expected Volume	100 KB
Expected Frequency	Weekly

5.11 Product History External Interfaces

Figure 5.11-1 shows the Product History interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.11-1. Product History Interfaces

5.11.1 Data Availability Notice for Product History

This email message from ECS notifies the SCF that Product History information has been staged following a request via the Release A Client or the Release B DCE Client. The format and content of the DAN are defined in Table 5.11.1-1.

Table 5.11.1-1. Description of Data Availability Notice for Product History

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)
Contents	Defined in Table 4.7-1
Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.11.2 Product History

This interface allows the SCF to obtain Product History information from ECS. The format and content of the data flow defined in Table 5.11.2-1.

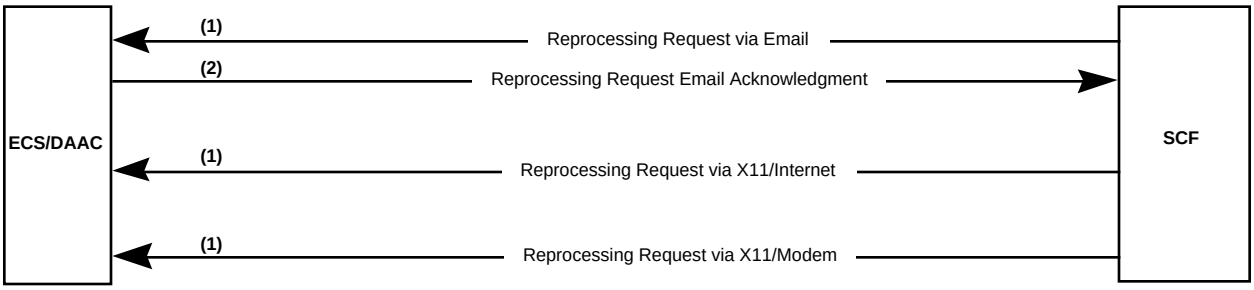
Table 5.11.2-1. Description of Product History

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	All or part of the staged data as specified in a previous DAN
Format	ASCII
Expected Volume	10 MB
Expected Frequency	Monthly

5.12 Reprocessing Request External Interfaces

These interfaces enable SCFs to request DAAC reprocessing of data produced by SCF-provided science software. Upon acknowledgment of receipt of the reprocessing request, the reprocessing request is added to the PDPS database at the appropriate DAAC, where it waits until it is explicitly added to a plan that is then activated. The reprocessing request follows the same process flow as a standard processing request.

Figure 5.12-1 shows the Reprocessing Request Interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.12-1. Reprocessing Request Interfaces

5.12.1 Reprocessing Request via Email

In both Release A and Release B the SCF can send Reprocessing Requests to the DAAC staff as email messages. These messages can include optional run time parameters. SCFs must use this email interface unless the DAAC has authorized their use of the Reprocessing Request X11 interfaces. The format and content of this request are defined in Table 5.12.1-1.

Table 5.12.1-1. Reprocessing Request via Email

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	DAAC
Interface Method	email (SMTP)
Contents	•PGE Name •The time window for which the product should be regenerated •Optional run time parameters
Format	Free form message to be read by a human
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.12.2 Reprocessing Request Email Acknowledgment

In both Release A and Release B the DAAC acknowledges receipt of the SCF's email Reprocessing Request by replying to the SCF in an email message that includes the SCF's original request. SCFs must use this email interface unless the DAAC has authorized their use of the Reprocessing Request X11 interfaces. The format and content of the acknowledgment are defined in Table 5.12.2-1.

Table 5.12.2-1. Reprocessing Request Email Acknowledgment

Data Flow Characteristic	Release A and Release B Description
Source	DAAC
Destination	SCF
Interface Method	email (SMTP)
Contents	"This is an acknowledgment of the receipt of the following Reprocessing Request: . . . "
Format	Determined by above "Contents"
Expected Volume	< 10 KB
Expected Frequency	Weekly

5.12.3 Reprocessing Request via X11 Interfaces

SCFs can use these interfaces at DAAC discretion in both Release A and Release B to request data reprocessing using their science data production software.

These interfaces require use of Kerberized telnet, X Window System (X11 protocol), and Motif and require connection via Internet or via dial up modems using switched circuits. SCF and DAAC routers provide further security by restricting access to a list of authorized SCF and DAAC host addresses and ports as established as part of the process by which the SCF obtains DAAC approval for remote I&T access. The DAAC also provides the SCF with the modem telephone numbers during that approval process if the SCF intends to use that option.

The SCF must have 1) one or more modems for the dial up option or 2) a router/firewall for the Internet option.

5.12.3.1 Reprocessing Request via X11/Internet

The format and content of this Release A and Release B interface are defined in Table 5.12.3.1-1.

Table 5.12.3.1-1. Description of Reprocessing Request via X11/Internet

Data Flow Characteristic	Release A and Release B Description
Source	SCF (SCF initiates the session. Data flows in both directions during the session.)
Destination	DAAC
Interface Method	Internet connectivity via an SCF fire wall/router Ktelnet (Kerberos Version 5 as defined by RFC 1510) X server (X11 Release 5) Motif version 1.2.*, where the * represents a positive integer
Contents	GUI interface for input of information to specify the reprocessing request, such as: 1. Product Type 2. The time window for which the product should be generated 3. Optional run time parameters
Format	Determined by X11 protocol
Expected Volume	Depends on user's use of the interface
Expected Frequency	Weekly

5.12.3.2 Reprocessing Request via X11/Modem

The format and content of the Release A and Release B interface are defined in Table 5.12.3.2-1.

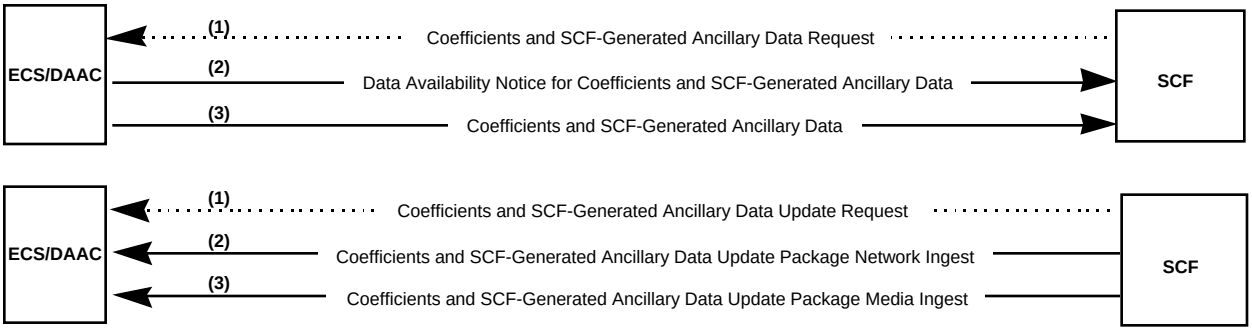
Table 5.12.3.2-1. Description of Reprocessing Request via X11/Modem

Data Flow Characteristic	Release A and Release B Description
Source	SCF (SCF initiates the session. Data flows in both directions during the session.)
Destination	DAAC
Interface Method	28.8 kbps V.34 modem Ktelnet (Kerberos Version 5 as defined by RFC 1510) X server (X11 Release 5) Motif version 1.2.*, where the * represents a positive integer

Contents	GUI interface for input of information to specify the reprocessing request, such as: 1. Product Type 2. The time window for which the product should be generated 3. Optional run time parameters
Format	Determined by X11 protocol
Expected Volume	Depends on user's use of the interface
Expected Frequency	Weekly

5.13 Coefficients and SCF-Generated Ancillary Data External Interfaces

Figure 5.13-1 shows the Coefficients and SCF-Generated Ancillary Data interfaces.



Notation: 1. Flows are ordered as numbered.

2. Arrows for external interfaces are solid and internal interfaces are dotted. Internal Interfaces are not defined in this ICD.

Figure 5.13-1. Coefficients and SCF-Generated Ancillary Data Interfaces

5.13.1 Data Availability Notice for Coefficients and SCF-Generated Ancillary Data

ECS sends this email message as notification that coefficients and SCF-generated ancillary data files have been staged following a request via the Release A Client or the Release B DCE Client.

The format and content of this DAN are defined in Table 5.13.1-1.

Table 5.13.1-1. Description of Data Availability Notice for Coefficients and SCF-Generated Ancillary Data

Data Flow Characteristic	Release A and Release B Description
Source	ECS (automated)
Destination	SCF
Interface Method	email (SMTP)

Contents	Defined in Table 4.7-1
Format	Defined in Table 4.7-1 Normally read by a human (also parsable by machine).
Expected Volume	< 10 KB
Expected Frequency	Depends on particular files being requested. Range from weekly to yearly.

5.13.2 Coefficients and SCF-Generated Ancillary Data

This interface allows SCFs to obtain Coefficients and SCF-Generated Ancillary Data from ECS. The format and content of the data flow are defined in Table 5.13.2-1.

Table 5.13.2-1. Description of Coefficients and SCF-Generated Ancillary Data

Data Flow Characteristic	Release A and Release B Description
Source	ECS
Destination	SCF
Interface Method	kftp get by SCF
Contents	All or part of the staged data as specified in a previous DAN
Format	Code: ASCII, 32-bit binary, 64-bit binary Data: HDF-EOS, HDF, 32-bit binary, 64-bit binary, ASCII Documents: rtf, ps, pdf, HTML (machine readable)
Expected Volume	Depends on the particular files being requested.
Expected Frequency	Depends on the particular files being requested. Range from weekly to yearly.

5.13.3 Coefficients and SCF-Generated Ancillary Data Update Package Network Ingest

SCFs use this interface to electronically deliver to ECS coefficients and ancillary data as an alternative to delivery as part of a Data Production Software Delivery Package. The format and content of the interface are defined in Table 5.13.3-1. Media ingest can be used as an alternative delivery mechanism.

5.13.4 Coefficients and SCF-Generated Ancillary Data Update Package Media Ingest

SCFs use this interface for coefficients and ancillary data that are transported on media from the SCF to a DAAC as an alternative to delivery as part of a Data Production Software Delivery Package. The format and content of the interface are defined in Table 5.13.4-1. Section 4.6 specifies the media types that can be ingested. Network ingest can be used as an alternative delivery mechanism.

Table 5.13.3-1. Description of Coefficients and SCF-Generated Ancillary Data Update Package Network Ingest

Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	ECS
Interface Method	kftp put or get
Contents	Determined by SCF
Format	Code: ASCII, 32-bit binary, 64-bit binary Data: HDF-EOS, HDF, 32-bit binary, 64-bit binary, ASCII Documents: rtf, ps, pdf, HTML Other: All files, except for metadata and delivery record files, optionally may be tar'd (machine readable)
Expected Volume	Depends on the particular files being ingested
Expected Frequency	Depends on the particular files being ingested. Range from weekly to yearly.

Table 5.13.4-1. Description of Coefficients and SCF-Generated Ancillary Data Update Package Media Ingest

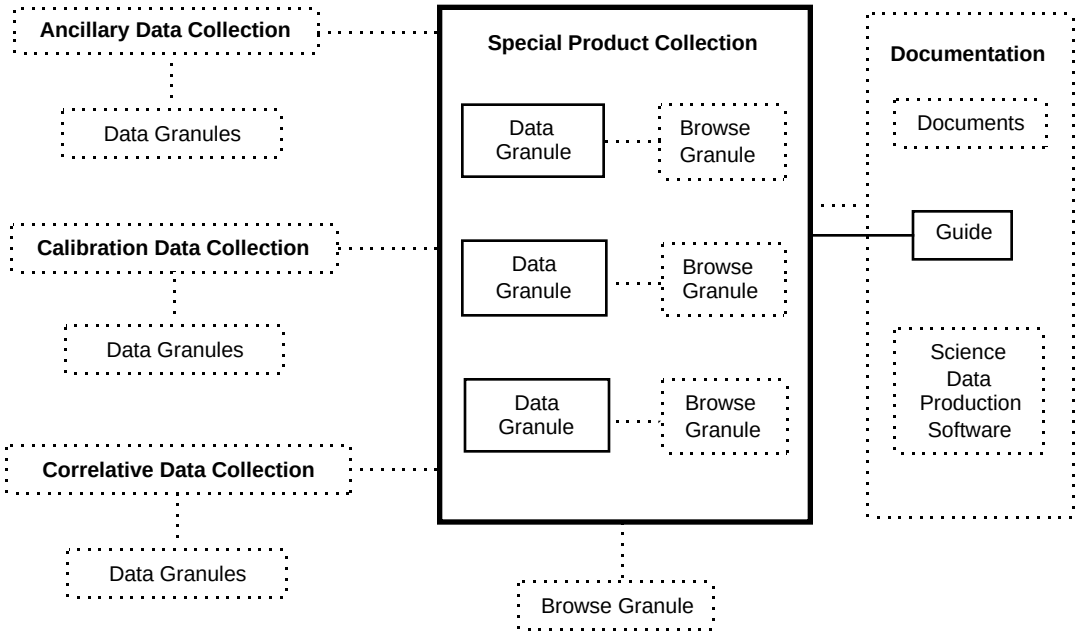
Data Flow Characteristic	Release A and Release B Description
Source	SCF
Destination	DAAC
Interface Method	Media ingest
Contents	Determined by SCF
Format	Code: ASCII, 32-bit binary, 64-bit binary Data: HDF-EOS, HDF, 32-bit binary, 64-bit binary, ASCII Documents: rtf, ps, pdf, HTML Other: All files, except for metadata and delivery record files, optionally may be tar'd (machine readable)
Expected Volume	Depends on the particular files being ingested
Expected Frequency	Depends on the particular files being ingested. Range from weekly to yearly.

5.14 Special Products External Interfaces

The interfaces in this section support ingest of Special Products and are allocated to Release B but not to Release A. Special Products, which contrast with standard products, are defined as products and related information produced by SCFs and archived and distributed by DAACs. Each SCF proposal for a new special product requires DAAC approval and creation of new Earth Science Data Types (ESDTs) and one or more data collections. The SCF initially uses a Web-based interface for a one-time specification of the Special Product's collection-level metadata as defined in Appendix B of the SDPS Database Design and Database Design Schema Specification, document number 311-CD-008-XXX. Note that the XXX in that document number represents the document's most recent version. Collection-level metadata for Special products are required to conform to the intermediate level of metadata in that appendix.

Subsequently the SCF uses the ingest interfaces to provide ECS with special product packages (data granules and their associated metadata as defined in Table 5.14-1) as shown in Figure 5.14-1. SCFs are expected to request ingest of Special Products Packages as often as necessary. Although SCFs provide some Guide information to the DAAC as part of the collection-level metadata, the DAAC prepares the actual Guide documents while using documents that the SCF provides while proposing a new special product. The DAAC operations staff may request further Guide information from the SCF via ad hoc means including telephone, email, and conventional mail.

Special product packages are allowed to contain a diverse set of components as depicted by Figure 5.14-1. The components of special product packages must include a data product (the data in the "special product" collection and its associated guide information) and optionally may include any number of the following related components -- ancillary data, calibration data, correlative data, browse data, documents, and the science data production software that was used to generate the special product.



Note: Solid lines enclose required components of Special Product Packages, and dotted lines enclose optional components.

Figure 5.14-1. Components of Special Product Packages

Each Special Product Package is required to include a delivery record file (reference Section 4.6), a metadata file that describes the package's contents, and one or more data files. Table 5.14-1 defines the required metadata for Special Product granules by reference to Appendix B of document number 311-CD-008-XXX, where XXX represents the latest version number. The "Intermediate" level of metadata in 311-CD-008-XXX is required for Special Products.

Although not required for Special Products, the “Full” level of metadata is recommended because by providing full metadata SCFs can obtain maximal ECS services for the Special Products. The value of OBJECT in the first row of this table specifies whether the data to be ingested are a part of a collection that is a special product, ancillary data, correlative data, or calibration data.

SCFs deliver the optional Science Data Production Software (SDPSW) to a DAAC following the general procedure described in Section 4.6 for other ingest interfaces. This optional Special Product component is considered as special product documentation in the box at the right of Figure 5.14-1. The required metadata for SDPSW come from two sources. First, metadata in Table 4.6-2 are required for ingest of the Science Data Production Software with which a Special Product is generated. When applied to a SDPSW, the “algorithm package” attributes in this table describe the SDPSW and the LongName and ShortName attributes describe the Special Product collection with which this SDPSW is associated. Second, other attributes not in Table 4.6-2 are required if applicable and if listed for DeliveredAlgorithmPackage in Section B.6 of the document Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project. All such applicable attributes are added to the PVL in Table 4.6-1 before ingest. For example, packages of Science Data Production Software that include documents would be required to include all of the metadata attributes for 'document' and 'author' that are specified as mandatory in the DeliveredAlgorithmPackage portion of Section B.6. And software packages that lack documents would be able to omit those attributes.

Table 5.14-1. Required Granule-Level Attributes in Special Product Metadata

(1 of 3)

Parameter	Description	Type	Format/ Max Size (Bytes)	Value
OBJECT	The start of a type of special product collection	Variable String	ASCII (40 B)	‘SpecialProductCollection’ ‘SpecialProductCollectionAncillary’ ‘SpecialProductCollectionCalibration’ ‘SpecialProductCollectionCorrelative’
OBJECT	The start of attributes that uniquely identify the collection	Fixed String	ASCII (10 B)	'ATTRIBUTES'
ShortName	Acronym or short name of the special product collection	Fixed String	ASCII (8 B)	Free text

VersionID	Version identifier of the special product collection	Variable String	ASCII (255 B)	Printable characters defaulting to ‘1’
CollectionDescription	This attribute identifies the major emphasis of the content of the collection. Some examples are: ‘cloud top products generated form instrument X’, or ‘all products containing the parameter sea surface temperature as skin temp.’	Variable String	ASCII (255 B)	Free text
END OBJECT	Marks end of attributes that uniquely identify the collection	Fixed String	ASCII (10 B)	'ATTRIBUTES'
OBJECT	Start of browse granule linked to the collection	Fixed String	ASCII (10 B)	<ESDT for browse granule>
OBJECT	The start of attributes for the browse granule	Fixed String	ASCII (10 B)	'ATTRIBUTES'
BrowseDescription	Textual description of the browse granule	Variable String	ASCII (255 B)	Free text
	Note: Insert one row here for each intermediate-level metadata attribute required for browse granules by document number 311-CD-008-001, Release B Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project. ***These granules are associated with a type of special product collection.***			
END_OBJECT	Marks end of attributes for the browse	Fixed String	ASCII (10 B)	'ATTRIBUTES'
END_OBJECT	Marks end of the browse granule linked to the collection	Fixed String	ASCII (10 B)	<ESDT for browse granule>
OBJECT	Start of document linked to the collection	Fixed String	ASCII (8 B)	‘Document’
OBJECT	The start of attributes for the document	Fixed String	ASCII (10 B)	'ATTRIBUTES'
	Note: Insert one row here for each intermediate-level metadata attribute for a document linked to the collection and required by document number 311-CD-008-001, Release B Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project..			

Table 5.14-1. Required Granule-Level Attributes in Special Product Metadata (2 of 3)

END_OBJECT	Marks end of attributes for the document	Fixed String	ASCII (10 B)	'ATTRIBUTES'
END_OBJECT	End of document linked to the collection (repeat for other documents)	Fixed String	ASCII (8 B)	'Document'
OBJECT	The start of granules associated with the collection	Variable String	ASCII (40 B)	'SpecialProductGranule' 'SpecialProductGranuleAncillary' 'SpecialProductGranuleCalibration' 'SpecialProductGranuleCorrelative' 'SpecialProductGranuleBrowse'
DATA_TYPE	The ESDT assigned to this particular Special Product	Fixed String	ASCII (10 B)	<ESDT for granule>
OBJECT	Start of browse granule linked to the data granule	Fixed String	ASCII (10 B)	<ESDT for browse granule>
OBJECT	The start of attributes for the browse granule	Fixed String	ASCII (10 B)	'ATTRIBUTES'
	Note: Insert one row here for each intermediate-level metadata attribute required by required for browse granules per document number 311-CD-008-001, Release B Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project. These browse granules are associated with a data granule.			

Table 5.14-1. Required Granule-Level Attributes in Special Product Metadata (3 of 3)

END_OBJECT	Marks end of attributes for the browse granule	Fixed String	ASCII (10 B)	'ATTRIBUTES'
END_OBJECT	Marks end of the browse granule linked to the data granule	Fixed String	ASCII (10 B)	<ESDT for browse granule>
OBJECT	The start of attributes for the data granule	Fixed String	ASCII (10 B)	'ATTRIBUTES'
	Note: Insert one row here for each intermediate-level metadata attribute required for data granules by document number 311-CD-008-001, Release B Science Data Processing Segment (SDPS) Database Design and Database Schema Specifications for the ECS Project. These data granules are associated with the collection.			

END_OBJECT	Marks end of attributes for the data granule	Fixed String	ASCII (10 B)	'ATTRIBUTES'
END_OBJECT	Marks end of the data granule Note: repeat granule object, as necessary, for additional data granules	Variable String	ASCII (21 B)	'SpecialProductGranule' 'SpecialProductGranuleAncillary' 'SpecialProductGranuleCalibration' 'SpecialProductGranuleCorrelative' 'SpecialProductGranuleBrowse'
END_OBJECT	Marks end of the collection Note: repeat collection object, as necessary, for additional collections	Variable String	ASCII (40 B)	'SpecialProductCollection' 'SpecialProductCollectionAncillary' 'SpecialProductCollectionCalibration' 'SpecialProductCollectionCorrelative'

SCFs are allowed to produce special products in well-defined non-HDF formats with prior DAAC concurrence but are encouraged to obtain more services by following the HDF standard and the HDF-EOS conventions for using HDF (references: HDF-EOS Primer for Version-1 EOSDIS and Thoughts on HDF-EOS Metadata). Special Products in non-HDF formats can be ingested, archived, and distributed to users. Producers of special products benefit from HDF (and the HDF-EOS conventions) for the following reasons:

- HDF facilitates physical porting of data.
- NASA provides institutional support for HDF.
- The effective "life" of data are extended because the data remain useful after the expertise of the providers is no longer available.
- HDF may become the science data standard for the World Wide Web, which would imply increased support for PC and Macintosh users.
- HDF is a very flexible generalized scientific format. HDF-EOS denotes Earth science conventions for using HDF and provides support for providers of product-independent services on the data.
- ECS provides generalized services on HDF such as viewing, subsetting, and subsampling. (If the HDF-EOS conventions are used, then these services can be specified by geolocation, in addition to row/column.)
- Most third-party vendors support HDF and in the future are likely to provide additional support for the HDF-EOS conventions.

- In the future, the HDF-EOS conventions are expected to support multiple files, facilitate subsetting across data tiles, and allow geolocation information to be stored separately from the data (allowing faster access by geolocation).

Figure 5.14-2 shows the special products interfaces.

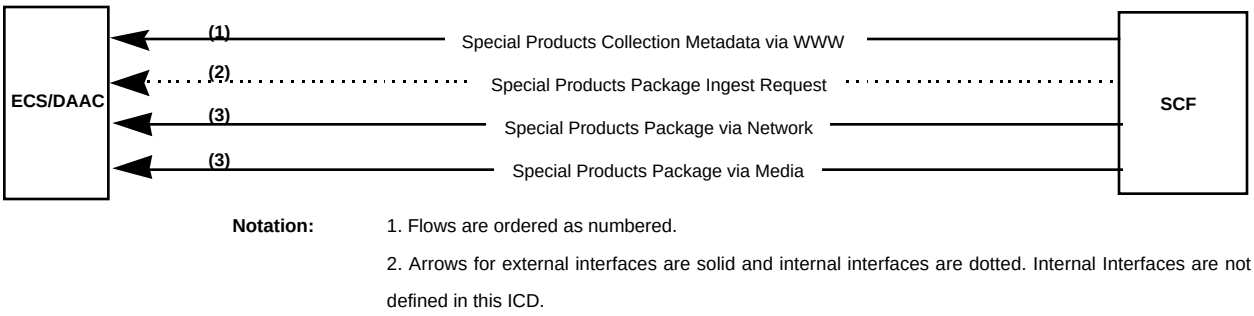


Figure 5.14-2. Special Products Interfaces

5.14.1 Special Products Collection Metadata via WWW

SCFs use this Release B interface in order to provide ECS with the collection-level metadata that are associated with the Special Product. This interface normally is used once soon after the Special Product has been formally authorized.

The format and content of the data flows are defined in Table 5.14.1-1 although to date no specific special products have been identified.

Table 5.14.1-1. Description of Special Products Collection Metadata via WWW

Data Flow Characteristic	Release B Description
Source	SCF
Destination	ECS
Interface Method	WWW
Contents	Mandatory attributes as defined by the Intermediate level of metadata in Appendix B of the SDPS Database Design and Database Design Schema Specification, document number 311-CD-008-XXX where XXX is latest version number.
Format	ASCII
Expected Volume	<= 10 KB and aggregate ingest volume, including network and media ingest, is not to exceed 10 GB/day (reference Goddard Space Flight Center, Functional and Performance Requirements Specification for the EOSDIS Core System (ECS), Table C-3)
Expected Frequency	Once per Special Product for initial definition followed by occasional updates and corrections

5.14.2 Special Products Package via Network

The SCF uses this Release B interface in order to request and accomplish ingest of Special Products. The format and content of the data flows are defined in Table 5.14.2-1 although to date no specific special products have been identified.

Table 5.14.2-1. Description of Special Products Package via Network

Data Flow Characteristic	Release B Description
Source	SCF
Destination	ECS
Interface Method	kftp put by SCF or get by ECS
Contents	As jointly determined by SCF and DAAC including a special product and optional components per Section 5.14.
Format	HDF-EOS, HDF, or native format
Expected Volume	Variable but aggregate ingest volume for all special products, including metadata and media ingest, is not to exceed 10 GB/day (reference Goddard Space Flight Center, Functional and Performance Requirements Specification for the EOSDIS Core System (ECS), Table C-3)
Expected Frequency	Variable

5.14.3 Special Products Package via Media

DAACs use this Release B interface in order to ingest Special Products that are received from the SCF on hard media. Section 4.6 specifies the acceptable ingest media. The format and content of the products are defined in Table 5.14.3-1 although to date no specific special products have been identified.

Table 5.14.3-1. Description of Special Products Package via Media

Data Flow Characteristic	Release B Description
Source	SCF
Destination	DAAC
Interface Method	Media Ingest
Contents	As jointly determined by SCF and DAAC including a special product and optional components per Section 5.14.
Format	HDF-EOS, HDF, or native format
Expected Volume	Variable but aggregate ingest volume for all special products, including network ingest and metadata, is not to exceed 10 GB/day (reference Goddard Space Flight Center, Functional and Performance Requirements Specification for the EOSDIS Core System (ECS), Table C-3)
Expected Frequency	Variable

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Appendix A. Internal and External Interfaces Between ECS and SCFs

Table A-1 lists the data interfaces between ECS and the SCFs in Releases A and B. The “from” column indicates the source of the flow and the destination of the flow is implicit. This table has general columns at the left, Release A Columns in the middle, and Release B columns at the right. Cells containing “n/a” identify information that is not relevant to Release A because the requirement is allocated to releases beginning with Release B.

“Internal” interfaces are defined for use herein as interfaces for which the SCFs use ECS-provided software for their side of the interface. Despite physical separation between the systems, these interfaces are considered to be within ECS or internal from a design specification point of view. “External” interfaces are defined as interfaces between ECS and systems using SCF-supplied software, which may be in the Public Domain or provided by a computer vendor. The internal interfaces are documented in the following ECS documents: ECS Ingest GUI in the Release A SDPS Ingest Subsystem Design Specification for the ECS Project and the Release B SDPS Ingest Subsystem Design Specification, the Release A Client in the Release A SDPS Client Subsystem Design Specification for the ECS Project, and the Release B DCE Client in the Release B SDPS Client Subsystem Design Specification for the ECS Project.

The ECS Ingest GUI is ECS-supplied software that provides SCFs with a means by which authorized staff can initiate ECS electronic ingest of SCF-developed science software or data.

The Release A Client is an integrated software package that combines the searching and ordering components of the Version 0 IMS GUI Client with the ECS Desktop and Advertising Service to provide the science user interface to the Release-A ECS. It consists of a GUI to be distributed to DAACs, SCFs, and other users. The Client provides the capability to search, browse, review, and request ECS data and services.

The Release B DCE Client is the ECS-developed replacement for the Release A Client that will be provided to the SCFs as part of Release B. The Release B DCE Client includes and extends the functionality of the Release A Client. SCFs without DCE clients in the Release A time frame can use all Release A internal and external interfaces as defined in this ICD. In the Release B time frame, SCFs without DCE clients can use the external interfaces as defined in the body of this ICD. In addition to those external interfaces, Table A-1 specifies internal interfaces that use the Release B DCE Client, which requires SCFs to have DCE clients installed on any workstation using the Release B DCE Client. (Other SCF workstations are not required to have DCE clients.) However, SCFs can obtain these functions by 1) continuing their use of the older Release A Client in the Release B time frame, 2) using a WWW Client as described in the body of this ICD, or 3) using the manual email interface in the case of QA Notification Specification (subscriptions). The Release A Client, the WWW Client, and email options do not require DCE clients.

Table A-1. Internal and External Interfaces Between ECS and SCFs in Releases A and B (1 of 4)

From ('To' is implied)	Data Flow Name	Internal or External in Rel A	Rel A Implementation Type	Internal or External in Rel B	Rel B Implementation Type
	Delivery of SCF Toolkit, Local Data Access Service, and other ECS Software:				
ECS/ SMC	ECS Software Package Announcement via Email	External	Manual email	External	Manual email
ECS	ECS Software Package Announcement via Bulletin Board (Resembles the above announcement)	n/a	n/a	External	ECS Bulletin Board
ECS/ SMC	ECS Software Package	External	Private ftp	External	Private ftp
	Science Software I&T Requirements:				
ECS	Integration and Test Requirements *	External	WWW	External	WWW
	Interactive Session Dialog:				
ECS/ DAAC or SCF	Interactive Session Dialog	External	email	External	email
ECS	Science Software Integration and Test Status	External	kftp (if specified in the Interactive Session Dialog)	External	kftp (if specified in the Interactive Session Dialog)
	Ingest of Science Data Production Software Packages:				
SCF	Data Production Software Delivery Package Ingest Request	Internal	ECS Ingest GUI	Internal	ECS Ingest GUI
SCF	Data Production Software Delivery Package via Network	External	kftp	External	kftp
SCF	Data Production Software Delivery Package via Media	External	Media Ingest	External	Media Ingest
	Remote SCF Access to DAAC Software Integration and Test Interfaces				
SCF	Remote Access Session Dialog via X11/Modem	External	X11 Access to DAAC	External	X11 Access to DAAC
SCF	Remote Access Session Dialog via X11/Internet	External	X11 Access to DAAC	External	X11 Access to DAAC

Table A-1. Internal and External Interfaces Between ECS and SCFs in Releases A and B (2 of 4)

	Provide SCF with Operational Science Data Production Software Package:				
SCF	Request for Operational Data Production Software Package via Client	n/a	n/a	Internal	Rel B DCE Client
SCF	Request for Operational Data Production Software Package via WWW	External	WWW	External	WWW
ECS	Data Availability Notice for Operational Data Production Software Package	External	email	External	email
ECS	Operational Data Production Software Package	External	kftp	External	kftp
	Provide SCF with Results of Software Tests and Receive Reviews from SCF:				
DAAC	Test Product Availability Message during Software Integration and Test (and after Test Product Request by SCF in Interactive Session Dialog)	External	email	External	email
SCF	Request for Test Products after software Integration and Test via Client	n/a	n/a	Internal	Rel B DCE Client
SCF	Request for Test Products after Software Integration and Test via WWW	External	WWW	External	WWW
ECS	Data Availability Notice for Test Products after Software Integration and Test	External	email	External	email
ECS	Test Products	External	kftp	External	kftp
SCF	Test Product Reviews	External	email	External	email
	Enable SCFs to make QA-related Subscriptions and Obtain Data for QA:				
SCF	QA Data Subscription Request via Client	n/a	n/a	Internal	Rel B DCE Client
SCF	QA Data Subscription Request via Email	External	email	External	email
ECS or DAAC	QA Data Subscription Request Acknowledgment	External	email	External	email
ECS	QA Data Subscription Event Notification	External	email	External	email
SCF	Request for Data to QA	Internal	Rel A Client	Internal	Rel B DCE Client
ECS	Data Availability Notice for Data to QA	External	email	External	email

Table A-1. Internal and External Interfaces Between ECS and SCFs in Releases A and B (3 of 4)

ECS	Data to QA.	External	kftp	External	kftp
	Enable SCF to update metadata based on the SCF's QA of SCF-Provided Science Data Products:				
SCF	On Time QA		Implemented as Metadata Updates		Implemented as Metadata Updates
SCF	QA Metadata Updates	External	WWW	External	Secure WWW
	Enable SCF to Request and Obtain Processing Status, Errors, and Diagnostics for SCF-Provided Science Data Products:				
SCF	Request for Processing Status via Client	n/a	n/a	Internal	Rel B DCE Client
ECS	Data Availability Notice for Processing Status	n/a	n/a/	External	email
ECS	Processing Status via Kftp	n/a	n/a	External	kftp
SCF	Request for Processing Status via WWW	External	WWW	External	WWW
SCF	Processing Status via WWW	External	WWW	External	WWW
SCF (PGE at DAAC)$^{+}$	Failed-PGE Diagnostics Files Request	Internal	SCF Toolkit Tool Call	Internal	SCF Toolkit Tool Call
SCF	Failed-PGE Diagnostics Subscription Request via Client	n/a	n/a	Internal	Rel B DCE Client
SCF	Failed-PGE Diagnostics Subscription Request via Email	External	email	External	email
ECS or DAAC	Failed-PGE Diagnostics Subscription Acknowledgment	External	email	External	email
ECS	Failed-PGE Diagnostics Subscription Event Notification	External	email	External	email
SCF	Request for Failed-PGE Diagnostics	Internal	Rel A Client	Internal	Rel B DCE Client
ECS	Data Availability Notice for Failed-PGE Diagnostics	External	email	External	email
ECS	Failed-PGE Diagnostics	External	kftp	External	kftp
	Enable SCF to Request and Obtain Resource Usage for SCF-Provided Science Data Products:				
SCF	Request for Resource Usage via Client	n/a	n/a	Internal	Rel B DCE Client
ECS	Data Availability Notice for Resource Usage	n/a	n/a/	External	email
ECS	Resource Usage via Kftp	n/a	n/a	External	kftp

SCF	Request for Resource Usage via WWW	External	WWW	External	WWW
ECS	Resource Usage via WWW	External	WWW	External	WWW
	Enable SCF to Request and Obtain Production History for SCF-Provided Science Data Products:				
SCF	Request for Product History	Internal	Rel A Client	Internal	Rel B DCE Client
ECS	Data Availability Notice for Product History	External	email	External	email
ECS	Product History	External	kftp	External	kftp
	Enable SCFs to Request Reprocessing of SCF-Provided Science Data Products:				
ECS	Reprocessing Request Template (Implemented via information in Contents row of Table 5.12.1-1 and as template GUI via the X11 interface)				
SCF	Reprocessing Request via Email	External	email	External	email

Table A-1. Internal and External Interfaces Between ECS and SCFs in Releases A and B (4 of 4)

ECS or DAAC	Reprocessing Request Email Acknowledgment	External	email	External	email
SCF	Reprocessing Request via X11/Internet	External	X11 Access to DAAC	External	X11 Access to DAAC
SCF	Reprocessing Request via X11/Modem	External	X11 Access to DAAC	External	X11 Access to DAAC
	Enable SCFs to Obtain and Update Coefficients and SCF-Generated Ancillary Data:				
SCF	Coefficients and SCF-Generated Ancillary Data Request	Internal	Rel A Client	Internal	Rel B DCE Client
ECS	Data Availability Notice for Coefficients and SCF-Generated Ancillary Data	External	email	External	email
ECS	Coefficients and SCF-Generated Ancillary Data	External	kftp	External	kftp
SCF	Coefficients and SCF-Generated Ancillary Data Update Request	Internal	Ingest GUI	Internal	Ingest GUI
SCF	Coefficients and SCF-Generated Ancillary Data Update Package Network Ingest	External	kftp	External	kftp
SCF	Coefficients and SCF-Generated Ancillary Data Update Package Media Ingest	External	Media Ingest	External	Media Ingest
	Ingest of Special Product Package Including a Special Product and Guide and Optionally Including Ancillary Data, Calibration Data, Correlative Data, Browse, Documents, and Data Production Software				
SCF	Special Products Collection Metadata via WWW	n/a	n/a	External	WWW
SCF	Special Products Package Ingest Request	n/a	n/a	Internal	ECS Ingest GUI
SCF	Special Products Package via Network	n/a	n/a	External	kftp
SCF	Special Products Package via Media	n/a	n/a	External	Media Ingest

*For particular SCF-DAAC pairs the procedures documents signed by those pairs of organizations will take precedence over the more generalized software developers' guidelines (DID 205, Part 4) cited herein.

+SCF (PGE at DAAC) interface is between the SCF's PGE during processing at the DAAC and ECS at the DAAC.

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Abbreviations and Acronyms

ARPANET	Advanced Research Project Agency Net
ASCII	American Standard Code for Information Interchange
B	Byte
CCB	Configuration Control Board
CDR	Critical Design Review
CDRL	Contract Data Requirement List
CSMS	Communications and Systems Management Segment
DAAC	Distributed Active Archive Center
DAN	Data Availability Notice
DCN	Document Change Notice
DCE	Distributed Computing Environment
DID	Data Item Description
ECS	EOSDIS Core System
email	electronic mail
EOC	EOSDIS Operations Center
EOS	Earth Observing System
EOSDIS	Earth Observing System Data and Information System
ESDIS	Earth Science Data and Information System
ESDT	Earth Science Data Type
ftp	file transfer protocol
GCMD	Global Change Master Directory
GSFC	Goddard Space Flight Center
GUI	Graphical User Interface
HDF	Hierarchical Data Format
HDF-EOS	HDF (with) Earth Observing System extensions
HTML	Hyper Text Markup Language

http	hypertext transport protocol
I&T	Integration and Test
ICCCM	Inter-Client Communication Conventions Manual (X Window System)
ICD	Interface Control Document
IDR	Incremental Design Review
IP	Internet Protocol
IRD	Interface Requirement Document
ISO	International Standards Organization
IST	Instrument Support Toolkit
KB	kilobytes
kftp	Kerberized file transfer protocol
ktelnet	Kerberized telnet
LAN	Local Area Network
MB	megabyte
mm	millimeter
NNTP	Network News Transfer Protocol
NSI	NASA Science Internet
pdf	portable document format
PGE	product generation executive
ps	Postscript [format]
QA	Quality Assurance
PVL	Parameter Value Language
RFC	Request for Comment
rtf	rich text format
SCF	Science Computing Facilities
SDP	Science Data Processing
SDPS	Science Data Processing Segment
SMTP	Simple Mail Transfer Protocol
SSL	Secure Socket Layer (protocol)

tar	UNIX command to archive files. Also, format of files archived by tar
TRMM	Tropical Rainfall Measuring Mission
UR	universal reference
URL	Universal Resource Locator
WAN	Wide Area Network
WWW	World Wide Web
XLFD	X Logical Font Description (X Window System)
Z	UNIX compressed format

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